

# Australian Personal Computer

Australia's leading computer magazine

September 1995

~~\$7.50~~  
**NOW  
ONLY  
\$6.95**

## PrimeTime

Tuning in to the Linux  
revolution

Pro-quality video  
production and  
image editing on  
your desktop

**apcmag** labs benchtests

Burn your own:  
CD recordable drives  
Professional image editors  
Brand-name consumer PCs  
Major Linux distributions

Plus: Windows 93 books  
• Price Watch: DVDs  
• Australia's role in Asia





# Order and prices to suit your taste.

## DELL® INSPIRON® NOTEBOOKS WITH MOBILE INTEL® PENTIUM® II PROCESSORS

### DELL DIMENSION® XPS R400

- Intel® Pentium® II Processor 400MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 32MB 100MHz SDRAM
- 6.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- **NEW 8MB AGP Video Card**
- Integrated Crystal Wavetable Sound
- **NEW 40X Variable EIDE CD-ROM Drive**
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3 year limited warranty

**\$3,359\***

or \$29 per week\*\*

Upgrade options: to 8.4GB Ultra ATA Hard Drive \$56, from 32MB to 64MB 100MHz SDRAM \$94

### DELL DIMENSION® XPS D300

- Intel® Pentium® II Processor 300MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 32MB SDRAM
- 4.3GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- **NEW 8MB AGP Video Card**
- Integrated Yamaha 32 Wavetable Sound
- 32X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3 year limited warranty

**\$2,499\***

or \$21 per week\*\*

Upgrade options: 56K Capable U.S. Robotics X2 WinModem \$169, Iomega Zip 100MB Internal Drive \$188



Dell® Inspiron® 3200

### DELL® INSPIRON® 3200 D266XT

- Intel® Pentium® II Processor 266MHz
- 512KB L2 Pipeline Burst Cache
- 32MB SDRAM
- 3.2GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 128-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X CD-ROM Drive
- 13.3" XGA Colour TFT Display
- Microsoft® Windows® 98
- 56K Data/Fax Modem
- Deluxe Carrying Case
- 1 year limited warranty

**\$4,729\***

or \$41 per week\*\*

Upgrade options: to 4.0GB Ultra ATA Hard Drive \$132, from 32MB to 64MB SDRAM \$113

### DELL® INSPIRON® 3200 D233XT

- Intel® Pentium® II Processor 233MHz
- 512KB L2 Pipeline Burst Cache
- 32MB SDRAM
- 3.2GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 128-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X CD-ROM Drive
- 13.3" XGA Colour TFT Display
- Microsoft® Windows® 98
- Deluxe Carrying Case
- 1 year limited warranty

**\$4,079\***

or \$35 per week\*\*

Upgrade options: 56K Data/Fax Modem \$282, Second Battery \$263

## DELL® PRECISION® WORKSTATION AND POWEREDGE® SERVER WITH INTEL® PENTIUM® II PROCESSORS



Dell® Precision® Workstation 410



### DELL® PRECISION® WORKSTATION 410

- Intel® Pentium® II Processor 400MHz (Dual Processor Capable)
- 512KB Single Bank Pipeline Burst Cache
- Mini Tower Chassis
- 64MB 100MHz SDRAM with ECC
- 4.0GB LVD SCSI Hard Drive
- 3.5" 1.44MB Diskette Drive
- Integrated 3Com Fast Etherlink XL
- Integrated Ultra2/Wide and Ultra Wide SCSI Controllers
- Integrated Dual ATA-33 EIDE Controller
- Diamond Permedia 2 8MB AGP Video Card
- Integrated SoundBlaster Pro Compatible
- 32X Variable SCSI CD-ROM Drive
- 17" Trinitron® Monitor (16.0" v.i.s.)
- Microsoft® Windows NT® 4.0
- 3 year limited warranty

**\$5,819\***

or \$50 per week\*\*

### DELL® POWEREDGE® 2300 SERVER

- Intel® Pentium® II Processor 400MHz (Dual Processor Capable)
- 512KB Internal ECC Cache
- Rack Mount Capable Mini Tower (Midnight Grey)
- 64MB 100MHz SDRAM with ECC (Upgradeable to 1.0GB)
- 4.5GB LVD SCSI Hard Drive
- 3.5" 1.44MB Diskette Drive
- Standard Intel® Pro 10/100 NIC
- Integrated Ultra2/LVD and Ultra/Narrow SCSI Controllers
- 32X Variable SCSI CD-ROM
- Dell® Mouse
- 15" Trinitron® Monitor (14.0 v.i.s.)
- Novell Netware® 4.11 or Windows NT® Server 4.0 (Optional)
- Standard Openview Network Node Manager S.E.
- 3 year limited warranty

**\$6,419\***

or \$55 per week\*\*

### Ordering

Easy as a phone call.  
Mon-Fri 8am-8pm,  
Sat 9am-3pm (EST).  
You can even order via  
our credit card secure  
WebStore, saving costly  
middleman mark-ups.

\*Prices and specifications subject to change without notice. All prices shown include tax and delivery is additional. Certain configurations can not be changed. Dell, the Dell logo and Dell Dimension, Inspiron and PowerEdge are registered trademarks of the Dell Computer Corporation. Precision is a trademark of the Dell Computer Corporation. The Intel inside logo and Pentium are registered trademarks of Intel Corporation. Microsoft, Windows 98 and Windows NT are registered trademarks of Microsoft Corporation. Other trademarks and trade names may be used in this document, refer to either the entities claiming marks and names or their products. Dell disclaims proprietary interest in the marks and the names of others. Dell is not responsible for errors in typography and photography. Photographed with options. For a complete copy of Dell's limited warranty offerings please write to Dell Computer Pty Ltd, Building 3, 14 Aquatic Drive, French Forest, NSW, 2086. \*\*Dell Financial Services offer rentals based on a 36 month term excluding stamp duty and FID which varies from state to state. Rentals and operating leases are available only to approved registered sole traders, partnerships and companies. Figures shown are indicative and may vary with interest rates. \*You'll need a valid credit card to access. 50 free hours must be used within the first month of registration. Normal Telstra charges apply. Copyright 1998 Dell Computer Corporation. All Rights reserved. DELL00032/APC/GSPREAD



**1300 303 107**

OR VISIT **www.dell.com.au**



# The best ingredients, made to order

## DELL DIMENSION® DESKTOPS WITH INTEL® PENTIUM® II PROCESSORS



Dell Dimension® XPS R Series

### DELL DIMENSION® XPS R400

- Intel® Pentium® II Processor 400MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- **NEW 8MB AGP Video Card**
- Turtle Beach Montego A3D64 Voice PCI Sound Card
- **NEW 40X Variable EIDE CD-ROM Drive**
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 56K Capable U.S. Robotics X2 WinModem
- Telstra Big Pond Internet Starter Kit with 50 hours free Internet access¹
- 3 year limited warranty

**\$3,669\***

or \$32 per week\*\*

Upgrade options: 17" Trinitron® Monitor (16.0" v.i.s.) \$461, Iomega Zip 100MB Internal Drive \$188

### DELL DIMENSION® XPS R350

- Intel® Pentium® II Processor 350MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 6.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- **NEW 8MB AGP Video Card**
- Integrated Crystal WaveTable Sound
- **NEW 40X Variable EIDE CD-ROM Drive**
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3 year limited warranty

**\$2,949\***

or \$25 per week\*\*

Upgrade options: from 64MB to 96MB 100MHz SDRAM \$94, 56K Capable U.S. Robotics X2 WinModem \$169

### DELL DIMENSION® XPS D333

- Intel® Pentium® II Processor 333MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- **NEW 8MB AGP Video Card**
- Turtle Beach Montego A3D64 Voice PCI Sound Card
- 32X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3 year limited warranty

**\$2,829\***

or \$24 per week\*\*

Upgrade options: 2X DVD-ROM Drive and Decoder Card \$282, 19" Colour Monitor (17.9" v.i.s.) \$461

### DELL DIMENSION® XPS D333

- Intel® Pentium® II Processor 333MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 32MB SDRAM
- 4.3GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- **NEW 8MB AGP Video Card**
- Integrated Yamaha 32 WaveTable Sound
- 32X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3 year limited warranty

**\$2,589\***

or \$22 per week\*\*

Upgrade options: to 6.4GB Ultra ATA Hard Drive \$66, from 32MB to 64MB SDRAM \$94

### DELL DIMENSION® XPS D300

- Intel® Pentium® II Processor 300MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- **NEW 8MB AGP Video Card**
- Turtle Beach Montego A3D64 Voice PCI Sound Card
- 32X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3 year limited warranty

**\$2,669\***

or \$23 per week\*\*

Upgrade options: 56K Capable U.S. Robotics X2 WinModem \$169, 2X DVD-ROM Drive and Decoder Card \$282



**Customisation**  
PCs configured to your precise specifications.



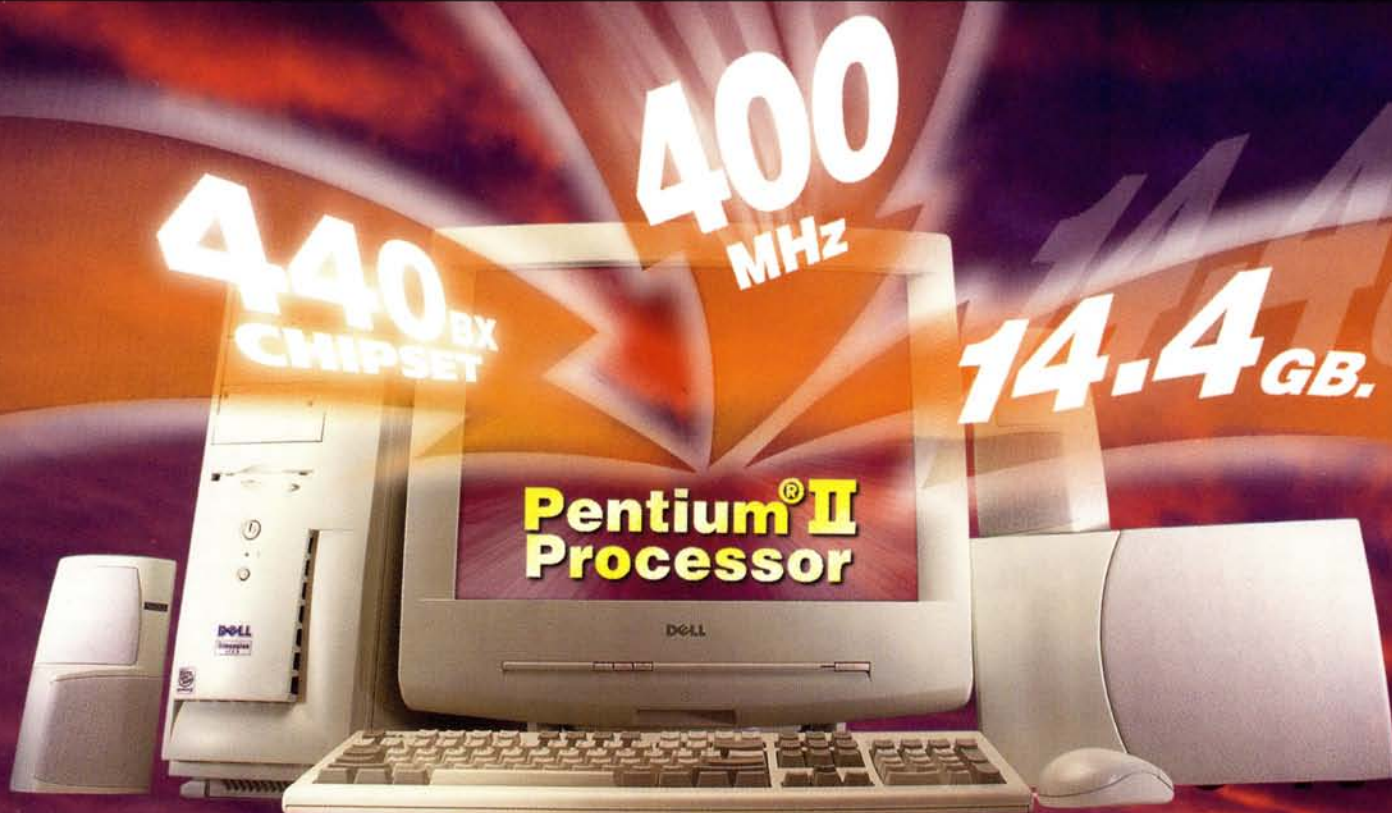
**Assurance of Quality**  
Our close relationships with industry leaders ensure you get the latest and best quality technology.



**Savings**  
Reductions in component costs are passed on to you almost immediately.



# FEED YOUR HUNGER FOR POWER AND PERFORMANCE.



Ready to do more, faster? Then get a Dell Dimension® XPS desktop with Intel® Pentium® II processor at 400MHz (or Dell® Inspiron® notebook at 266MHz) pre-loaded with Microsoft® Windows® 98. All available in one phone call or a visit to our Web site. You can then custom configure your Dell PC to meet your requirements.

You can have the Intel® 440BX AGP set with 100MHz memory bus, giving you the power to run today's and tomorrow's most demanding applications. You can also enjoy ultra real graphics and smooth flowing video from your 40X Variable EIDE CD-ROM drive or 2X DVD-ROM Drive (upgrade option). You'll never run out of puff for multi-tasking or multimedia with 128MB 100MHz SDRAM or when you upgrade to a whopping 14.4GB Ultra ATA Hard Drive. And your entire PC experience will be brought to life by the latest 17" colour monitor and Turtle Beach Montego A3D PCI soundcard.



So whether it's business or pleasure, the latest Dell Dimension® desktops are ready and waiting for your call.

\*Prices and specifications subject to change without notice. All prices shown include tax and delivery is additional. Certain configurations can not be changed. Dell, the Dell logo and Dell Dimension, are registered trademarks of the Dell Computer Corporation. The Intel inside logo and Pentium are registered trademarks of Intel Corporation. Microsoft, Windows 98 are registered trademarks of Microsoft Corporation. Other trademarks and trade names may be used in this document, refer to either the entities claiming marks and names or their products. Dell disclaims proprietary interest in the marks and the names of others. Dell is not responsible for errors in typography and photography. Photographed with options. For a complete copy of Dell's limited warranty offerings please write to Dell Computer Pty Ltd, Building 3, 14 Aquatic Drive, Frenchs Forest, NSW, 2086. \*\*Dell Financial Services offer rentals based on a 36 month term excluding stamp duty and FID which varies from state to state. Rentals and operating leases are available only to approved registered sole traders, partnerships and companies. Figures shown are indicative and may vary with interest rates. †You'll need a valid credit card to access. 50 free hours must be used within the first month of registration. Normal Telstra charges apply. Copyright 1998 Dell Computer Corporation. All Rights reserved.

## DELL DIMENSION® XPS R400

- Intel® Pentium® II Processor 400MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
- 10.0GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- **NEW 8MB AGP Video Card**
- Turtle Beach Montego A3D64 Voice PCI Sound Card
- **NEW 40X Variable EIDE CD-ROM Drive**
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 56K Capable U.S. Robotics X2 WinModem
- Iomega Zip 100MB Internal Drive
- Telstra Big Pond Internet Starter Kit with 50 hours free Internet access†
- 3 year limited warranty

## \$4,229\*

or \$36 per week\*\*

Upgrade options: 2X DVD-ROM Drive and Decoder Card \$226, Alttec Lansing ACS-495 Full Dolby® Surround Sound Speakers with Subwoofer \$216

CALL **1 300 303 107** OR VISIT **www.dell.com.au**

**LOOK INSIDE FOR OUR LATEST PC DEALS...**





**apcmag**

On apcmag.cd: The ultimate multi

**100% Australian content**

**FEATURES**

The brain drain: How do you find good IT staff?

Fear and loathing on the venture capital trail

**FIRST TAKE**

Microsoft Visual Studio 6.0

Intel Xeon Pentium III

Omega Buz

Compaq Presario 1650 notebook

Mobile Essentials

NetOptimizer

**WORKSHOP**

- Deciphering DVD
- Power searching the Web
- Replacing the Windows 95 Explorer
- **Plus:** Developers Corner, JavaScript, HyperText, Mac OS, OS/2, Linux, Shareware and much more

**On this month's CD**

**OVER 125 NEW PROGRAMS  
AND 20 UPDATES**

- 15 top multimedia viewers and editors
- 5 professional image editor trials and demos
- Over 30 applications to help you join the Linux revolution
- 20 great TV themes for Windows
- 24 Kaleidoscope themes for Macs
- Programs for physical and intellectual self-improvement

If your jam-packed CD is missing, ask your newsagent!

# Australia's Personal Computer

Australia's leading computer magazine

## PrimeTime

Tuning in to the  
revolution

Pr  
pr  
im  
yo



## PRIME TIME

Video, audio and multimedia hit the big time on your desktop. Plus self-help tools for the TV generation!

## FOR YOUR VIEWING PLEASURE

15 top multimedia viewers and editors. Manipulate, display and play files in just about any format.

## THE IMAGE MAKERS

Professional image editor trials and demos.

**Plus** Adobe Premiere: Create video from your desktop.

## LINUX: THE PENGUIN GOES PRIME TIME

Over 30 awesome applications to help you join the Linux revolution.

## REVIEWS

Adobe Premiere 5.0 ■ Fractal Design Painter 5 ■ Paint Shop Pro 5.01 ■ PhotoImpact 4 ■ Photoshop 4.0 ■ Picture Publisher 8 Internet Edition

## IMAGE EDITORS

ACDSee 2.3 ■ CompuPic 1.80 ■ EZ-Viewer 2.0 ■ Eye Candy 3.01 ■ Graphic Workshop 1.1Y ■ HyperCam 1.32.00 ■ ImgViewer/32 2.2 ■ IrfanView32 2.83 ■ LView Pro 2.0 ■ MediaBlaze 98 1.50d ■ Multimedia Xplorer 2.0b2 ■ PicaView32 1.21 ■ PolyView 3.03 ■ QuickTime 3.0 ■ ThumbsPlus 3.3 ■ Ulead PhotoImpact Viewer 4.0 ■ XingMPEG Player 3.0

## LINUX TOOLKIT

BitChX 75p1 ■ Elm ■ Enlightenment DR 0.14 ■ EzPPP 1.0B9 ■ FetchMail 4.5.3 ■ Freeciv ■ ImageMagik 4.0.7 ■ Imlib 1.7 ■ KDE 1.0 ■ Kernel updates ■ MP3-Studio ■ MySQL 3.21 ■ NEdit 5.02 ■ NetPBM ■ PPPd 2.3.5 ■ Pine 4.01 ■ PostgreSQL 6.3.2 ■ ProFTPD 1.1.4 ■ RealPlayer 5.0 for RedHat 5.0 ■ Samba 1.9.18p8 ■ The Gimp 0.99.29 ■ Tk3Play 2.0e ■ TkRat 1.2 ■ Window Maker 0.17.5 ■ X-ISP 2.5 ■ X-Plorer ■ gEdit 0.4.5 ■ sendmail 8.9.1

## IMPROVE YOUR IMAGE

AstroMart 5.3 ■ Bio-Rhythms 1.09.00 ■ Cool Quotes 2.0 ■ DietWatch 3.01 ■ Grammar Reference 3.0 ■ NutriGenie Nutritionist 98 6.0 ■ PC Webopaedia Lite 1.9 ■ Path-Minder 2.0 ■ RocketReader 4.0 ■ Super Mind Power 1.3a ■ The Cross Trainer 2.7 ■ Thinking Man's Thesaurus 1.1 ■ Weight Tracker 3.5

## THEMES

Absolutely Fabulous ■ AfterStep 3.0 Environment ■ Ally McBeal ■ Beavis & Butthead ■ Blake's 7 ■ BoilerPlate ■ Bond Street ■ Bravado ■ Buck Rodgers ■ Cecil III — Final Consequence ■ Desktop Themes 1.80 ■ DollyDots Tubu ■ Doorguy Alternate ■ Dr Katz ■ EC ■ ER ■ Forest ■ GUI Junky, The Scheme +2 ■ H R Giger ■ KSM ■ Ka-Bong 2 ■ MacGyver ■ Melrose Place ■ Men Behaving Badly ■ Millennium ■ Ocean Wave ■ Ozymandias II ■ PurpleTechII ■ PurpleTechIII ■ Quantum Leap ■ Rocky & Bullwinkle ■ SilverBarrel II ■ Sliders ■ Solitaire ■ Spin City ■ Sunset ■ The A-Team ■ The Young Ones ■ True iMac ■ Under World II ■ Windows Scheme Pack 2 ■ XLR Black2 ■ XLR Gold

## WORKSHOP

**Linux** Dumb ■ Maelstrom ■ Sox 12.14 ■ Space Boom ■ X-Bomber **Mac** CD Equalizer + Karaoke 3.2 ■ CD to AIFF 1.2c ■ ConvertMachine 1.2 ■ Mpecker Encoder 020b7 ■ SndSampler 3.5.2 ■ Virtual Drummer 3.1 **Windows** Grand Chess 1.2 ■ LaserChess 98 ■ RusCell95 1.0 ■ Solitude for Windows 1.28 ■ TurboGo 4.01 for Windows 95 **OS/2** Entertainment Pack for OS/2 2.7g ■ Matrix 1.3 ■ PM Maze 1.00a ■ Sorry for OS/2 1.00

## NETKIT

Becky! Internet Mail 1.24.13 ■ Hogwasher 1.0.3 ■ ICUII 2.5 ■ LeechFTP 1.3 ■ QuickFinger 1.0.2 ■ WinTel32 2.5.5

## GAMEZONE

Cyberstorm ■ Triple Play 99

## FIRST TAKE

Norton Mobile Essentials

## BROWSERS

Microsoft Internet Explorer 4.01 SP1 ■ Microsoft Internet Explorer 3.02 ■ Microsoft Internet Explorer 3.03 ■ Netscape Communicator 4.5 PR 1 ■ Netscape Communicator 4.05 ■ Netscape Navigator 4.05



# WITH OUR 24 HOUR MENU.

Want to see what Dell® machines really look like? Just do what 120,000 people do every week and visit our 24 hour WebStore.

There's everything from the latest 400MHz Dell Dimension® desktops and 266MHz Inspiron® notebooks, right through to PowerEdge® 6300 data centre servers. The site is fast to navigate and fast to use, with easy to print side by side comparison pages showing features and benefits for all Dell models at a glance.

Plus you can do a lot more than just browse. You can configure your own machines – mixing and matching hard drives, CD-ROM Drives, DVD-ROM Drives and colour monitors to build your ideal system. And, you can choose from our range of software options.

The Dell WebStore also makes purchasing easy. You pay for your order over our secure credit card payment system – the site turns over almost US\$6 million daily – and we start building your machine straight away. Delivery can be to your home or office.

The Dell Web site also helps after your purchase – with a complete technical support service. There's bound to be something that interests you at [www.dell.com.au](http://www.dell.com.au)



## THE LATEST TECHNOLOGY

Check out our WebStore or this ad and you'll notice another benefit of dealing with Dell. You always get the very latest technology. That's because we don't build your machine until you place your order.

So when a new Intel® processor is launched, our machines are one of the first to feature it. The same goes for software like Windows® 98, or hardware like the 40X CD-ROM or 2X DVD-ROM Drives.

If there's a motherboard upgrade, a better graphics port, an improved Video or Sound Card, a bigger Hard Drive, a sharper screen or extra memory, Dell PCs will be one of the first to feature it. Ready to be delivered to your door.

## CALL DELL

Call Dell today, Mon-Fri 8.00am-8.00pm, Sat 9am-3pm.

# DELL®



## 1300 303 107

OR VISIT [www.dell.com.au](http://www.dell.com.au)

### DON'T TAKE OUR WORD FOR IT – HERE'S WHAT OTHER PEOPLE THINK.



PC Computing USA "BEST" award for Best Overall System  
Dell Dimension® XPS R400 August 1998



PC Magazine USA "Readers Choice Service & Reliability" A Grade  
Dell Notebooks July 1998





# Why settle for an Internet ser



As the Internet gives you more, will your Internet Service Provider cost you more? Not if your provider is Telstra Big Pond® Home. We continue to offer you more for much less with our premium 56k compatible network<sup>1</sup>, now locally accessible in 54 locations Australia-wide.

With a choice of flexible pricing plans tailored to how much time you spend online, and our up-to-the-second billing facility, you can easily manage your Internet costs.

1. Actual data transfer speed may be limited by the capabilities of your phone line. 2. Web site limited to 5Mb stored and 100Mb served per month. 3. Normal telecommunication charges apply to your call to access our dial in locations. Registration requires a valid credit card.





vice that isn't value for money?

What's more, when you subscribe to Telstra Big Pond Home you'll enjoy access to exciting online content from **ninemsn**. You'll get a personal web page<sup>2</sup> and excellent customer support 7 days a week. All at no extra charge.

New subscribers can even try Big Pond Home free<sup>3</sup>. Simply visit [www.bigpond.com](http://www.bigpond.com) or dial FREECALL™ 1800 804 282\* and receive eight trial hours in your first month. You won't be pouring your money down the drain with Telstra Big Pond Home.

**Telstra**  
Making life easier™



# 10 Mbps, 100 Mbps, VLAN. And

## Layer 3 Switching

Now the Intel® Express 550 Routing Switches let you segment your network to reduce congestion and increase security – more simply, quickly and economically than with a traditional router.

## Easy, Comprehensive Management

Advanced Web and Windows\* based management tools simplify installation, management and configuration.

## 10 to 100 to 1,000Mbps

Autosensing on each port delivers Fast Ethernet when and where you need it, and the Gigabit Ethernet module provides support for connecting to the backbone, switch-to-switch and switch-to-server.



## Fibre

2-port 100FX module supports long-distance fibre connections over distances up to 2km.

## Scalable Stackable Technology

With Intel's Scalable Stacking Technology, performance is also scalable. Every switch you add to a stack brings with it an additional 2.1Gbps of bandwidth to the high-speed backplane. So as your network grows, your switching capacity increases to meet the new demands.



\* EURO RS-CG (SN0099)/A/A



# Gigabit, Fibre, Layer 3, then some.



## Intel's Adaptive Technology

Optimises performance independently on each port, dynamically adjusting the switching mode based on traffic conditions.

## VLAN Support

Offers a new level of flexibility in segmenting corporate networks, offering increased performance, management and security capabilities.



## FasterSimpler NETWORKS

Intel's switching solutions deliver flexibility and enhanced performance that adapts as the needs of your network grow.

For details of how the Intel® Express 500 series of switches can help you manage your evolving network call 1800 818 106, or simply visit our web site.

► [www.intel.com/apac/eng/network/au/fe](http://www.intel.com/apac/eng/network/au/fe)

intel®





## The penguin groundswell

*Is Linux the next computing revolution, or just another fad?*

**By Jeremy White**



Over the years, there have been a number of 'groundswells' in computing and technology. They come along almost regularly, shaking the entire IT industry to its foundations. Sometimes they pass without trace, proving to be nothing more than the rumbling instability of short-term fads and hype. Other times they rip the IT world's structures asunder, tearing assumptions apart, and clearing the old and weak infrastructure out of the way to make way for genuine technological advance. But either way, they always catch the various experts and pundits by surprise.

It's not hard to work out why.

First of all, you think that all the ground rules for technology have been determined. You know what the standard operating systems and applications are. Windows 95 goes on corporate desktops until NT 5 is released. NT 4 goes on high-end workstations, and you run NT Server and BackOffice at the server. You run Office and Outlook and Exchange. You have an intranet and a Web site. You put Windows 98 on your home PC and notebook. You're not going to get fired because you bought IBM or Compaq desktops and HP servers. There's no need to take risks because all the trade publications say that everyone does this. Even your great aunt knows that you need ecommerce.

Secondly, you think you're standing on solid ground. The dominant players, say Microsoft and Intel, are so well entrenched and in control of the market that their biggest competitive threats are being investigated by the DOJs and FTCs of the world.

And finally, you've done all the groundwork: you know the tools and techniques, you understand the platforms and how to make use of it all.

Then all of a sudden the earth starts to tremble. The groundswell rumbles quietly at first in specialised newsgroups and discussion lists. Then it rattles and shakes in the IT trade press. And grows into a roaring crescendo in the pages of the *New York Times* and *Forbes*, until it reaches the *Daily Telegraph* and evening TV news. The earth breaks apart, and the latest trend pops out into the open air of mainstream computing, Bugs Bunny-like, and asks 'what-sup.doc?'.

Some of these groundswells have been of genuine significance. The creation of personal computing in the first place, ushered in by Altair kits, the Apple II, Atari 400, the TRS-80, Commodore Pet and Vic-20, and then legitimised by IBM, was a huge groundswell that created a tectonic shift in the use of technology throughout society, and which is still rumbling 20 years later. Or the Internet, which again is a 25-year phenomenon, still on the rise and still to have its true impact felt. Likewise, the changes from character-based to human-driven, more graphical interaction have had a significant impact.

But then you get groundswells that create hype very quickly, but of which the long-term impact is unclear. Java is a good example. Anyone with common sense is going to find it hard to argue against the generic principle of a write-once, run-everywhere development language. But it's regarded by many now almost as a passing fad, simply because it hasn't delivered within two years of its conception.

In that basket go the thin client, the intranet/extranet, software companies becoming media companies, portal sites, and no doubt most of the headline stories from *ComputerWorld* and *PC Week* during the past five years.

Linux seems to me to represent a phe-

nomenon much closer to the first category than the second. It's had a seven-year gestation period, which is respectable. It's the headline-grabbing symbol for a type of software architecture, rather than a single product or platform — open or GNU-based software. And it attracts the same type of passionate devotees who drove the PC revolution, and who were evangelising the Net 15 years ago. There are a number of such devotees at APC. You don't hear people talking about Word the way they talk about Linux. It's almost Messianic.

Linux has just made cover story on *Forbes*: 'Peace, love and software'. Much like personal computing after 10 years, and the Net after 20, Linux has, to paraphrase an old cliché, become an overnight hit after seven years, especially now that enterprise support for the OS is growing (see our news report on page 17).

I'm sitting on a test version of an APC-customised Red Hat distribution of Linux, wondering how long it will take me to get up to speed in a new OS. Every couple of days, Travis Simon asks me eagerly, "Have you installed it yet?". The Linux-inclined around the office mail-bomb the rest of the office a few times a day with Linux snippets and stories. If we post a Linux question on [apcmag.com](http://apcmag.com), we get hundreds of responses.

Something tells me that the Linux groundswell is hitting crescendo level, and the forces driving it are more significant than if it were just a 'cool' OS. Whether it will peter out Java-like, or go on to smash the Microsoft/Intel duopoly, I can't say. But I do know that there is a passion driving this groundswell, the rumbles are growing louder, and the penguin may be about to surface.

You can reach Jeremy White at [jwhite@acp.com.au](mailto:jwhite@acp.com.au).



## NEWSWIRE

17

News Roundup	17
Open source gets respectable	17
Net banking faces hurdles	17
Y2K warnings intensify	20
Email: The latest office time waster	20
IT salaries keep rising	22
NOIE sells ecommerce	22
Copyright copies past mistakes	22

## NEWS ANALYSIS

Can Australia redefine its role in Asia?	24
Juniper steps into the light	26

## FORUM

42

EDITORIAL	6
READERS' SAY	42

## TWO BITS WORTH

Helen Dancer	
Spare me, please!	44
Jeremy Horey	
Choosing wisely	46
Cathie Kennedy	
Managing virtual workgroups	48
Bruce McCabe	
Where computers go to die	50
Julian Ehrlich	
Unemployment: Invisible insanity	52
Jeremy Torr	
The peripheral that isn't. The network that is	54

## PRICE WATCH

DVD for your PC	57
-----------------	----

## SERVICE AND RELIABILITY

Your basic rights	58
-------------------	----



## CORPORATE

What's in a name?	60
-------------------	----

## FAMILY

Building on solid foundations	62
-------------------------------	----



## PICTURE PERFECT

Video, audio and multimedia have long been touted as drivers of the personal computing phenomenon. But for almost as long, professional-quality capabilities have remained tantalisingly out of the reach of the average PC owner. This month APC provides a comprehensive guide to video production and image editing on your desktop. For those wanting to save their images and sound to cheap media, have a look at our comparative reviews of CD-Recordable (CD-R) drives.

## IMAGE EDITORS

Reviews to help you decide what you need.	105
---	-----

## ON THE RECORD

Six CD-Recordable (CD-R) drives reviewed.	123
---	-----

## WHO'S IN CHARGE AROUND HERE ANYWAY?

Understanding video production standards.	133
---	-----

## SO, YOU WANNA BE IN PICTURES?

A look at what's involved in starting your own video production business.	135
---	-----



## FEATURE

65

## WANTED

IT staff are pretty thin on the ground. Where can you find good people — and how do you keep them? 65

By Selina Mitchell

Tickling the fancy 66

What's hot 68

Who will it be? 72

Why go? 74



## FEAR AND LOATHING ON THE VC TRAIL

Since our landmark feature last December, venture capital has surged into the national technology consciousness. But are Australia's problems being addressed? 79

By Dan Tebbut

Why OzEmail went to Nasdaq first 86

## SOFTWARE

90

## A PENGUIN FOR ALL SEASONS

Linux has rapidly become a popular OS system choice for a new generation. We show you the different paths you can take. 90

By James Morris

Editor's Choice 94

Non-PC distributions 94

How we tested 96

Specialised distributions 98

Free distributions 100

New developments 100

Linux distributions at a glance 102

Want more Linux? 102

Glossary of terms 103



Caldera Open Linux 1.2 92

Debian GNU/Linux 2.0 Beta 94

Red Hat Linux 5.1 96

Slackware Linux 3.5 100

SuSE Linux 5.2 102

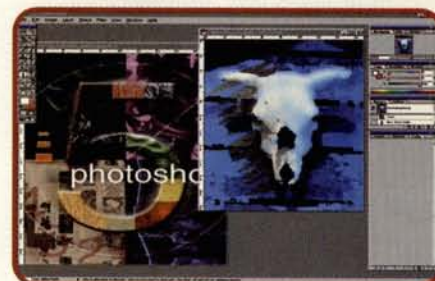
## IMAGE EDITORS

There are vast differences between image editors — and their prices. These reviews will help you figure out how much you need to pay. 105

By Jim Endersby

Editor's Choice 108

How we tested 110



Adobe Photoshop 5 106

Corel PhotoPaint 8 106

Jasc Paint Shop Pro 5 110

Macromedia xRes 3 112

Micrografx Picture Publisher 8 114

Ulead PhotoImpact 4 114

MetaCreations Painter 5 115

## HARDWARE

117

## CONSUMING INTEREST

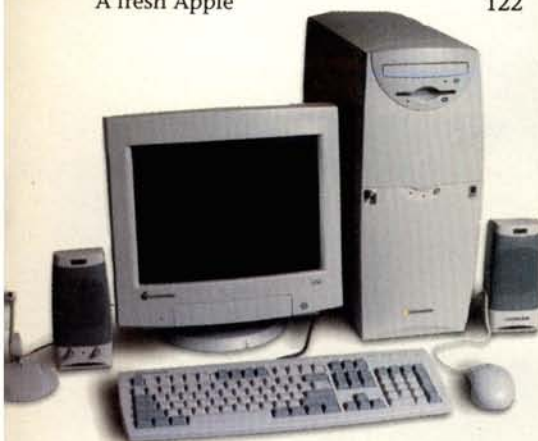
Rounding up consumer systems from the multinational vendors should be a cinch, right? 117

By APC staff

Editor's Choice 118

How we tested 120

A fresh Apple 122



Acer Aspire TS134 118

Gateway G6 300 118

IBM Aptiva EQ3 120

## ON THE RECORD

Saving data to cheap media using CD-Rs is becoming a popular option for users. 123

By Philip Moore

Editor's Choice 124

How we tested 126



Kodak Digital Science 2801IDE 124

Panasonic PW-7502 124

Plextor PX412Ci 124

Smart and Friendly CD SpeedWriter 126

Teac CDR55Si 126

Traxdata CDR4120 ELPRO 130

## HARD DISK DRIVE REVIEWS

Interested in building your own PC but not sure about component performance? This month we can help you out with our comparative review of seven Ultra DMA hard disk drives over 8.4G. For this Web-only feature go to [apcmag.com](http://apcmag.com).

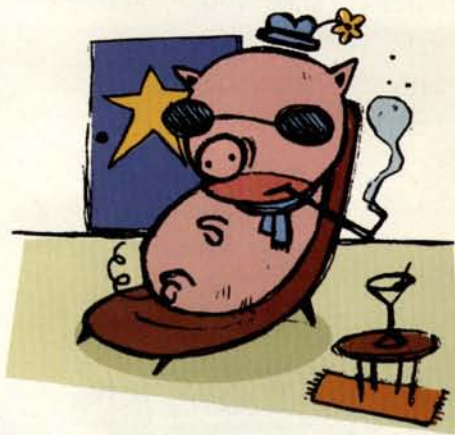
## TECHNICAL

133

## WHO'S IN CHARGE AROUND HERE, ANYWAY?

Desktop video production can take your work to a 'professional' level, but there are a lot of standards to understand first. 133

By Jason Gregg



## JUST DIY

135

## SO, YOU WANNA BE IN PICTURES?

This month we look at what's involved in starting your own video production business. 135

By Jason Gregg





# It's that fast.

Well, faster actually. Because the real value, after all, is time. And Maxtor DiamondMax™ hard drives offer award-winning performance that simply gets you where you want to go, faster. *Like seek times as low as 9.0ms.* But Maxtor doesn't believe speed is the exclusive property of the hard drive. We apply it to customer service as well. Only Maxtor offers the No Quibble® guarantee that means you'll get what you need, when you need it—fast. For the ultimate in desktop hard drive performance and service, look to Maxtor. **Maxtor. It's that simple.**

**SERVEX**

Maxtor products are distributed by Servex Australia Pty Ltd ([www.servex.com.au](http://www.servex.com.au))  
Tower A, Level 3 • 112-118 Talavera Rd • North Ryde, NSW 2113 • Australia  
Phone: (02)98701949 • fax: (02)98701931 • email: [dchan@acer.com.au](mailto:dchan@acer.com.au)



**Maxtor®**  
it's that simple.

[WWW.MAXTOR.COM](http://WWW.MAXTOR.COM)



## FIRST TAKE

29

## INTEL PENTIUM II XEON

The latest launch by Intel.

29



## MICROSOFT VISUAL STUDIO 6.0

A handy update for Windows developers.

30

## IOMEGA BUZ

An option for medium-quality video production.

34

## NORTON MOBILE ESSENTIALS

An attempt to ease the pain of business travel.

34



## XIRCOM REALPORT

A great card and a great idea, but expensive.

36

## COMPAQ PRESARIO 1650

A good notebook at a good price.

38

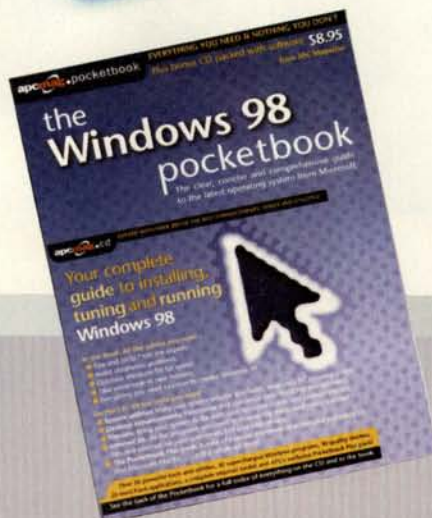
## CHECK IT NETOPTIMIZER

A package intended for optimising Net connections.

40

## THE GADGET FILE

36



## AFTER HOURS

195

## BIBLIOFILE

Windows 98 195  
 Perspective: A war of words 198



## INTERACTIVE

The Tastes of Italy, A Taste of Japan, Vegetarian Delights; The Tax Files; Ingenious 199  
 Interactive News 200

## GAMEZONE

Forsaken, Commandos: Behind Enemy Lines; Cyberstorm 2: Corporate Wars; Triple Play 99; Monster Truck Madness 2 201

## WEB FILE

Food for thought 205  
 Surfbaud: Bread alone? 206

## CHIP CHAT

A tale of several cities, and mucho defective software 208  
 Contest: Technology Gag of the Month 208

## ADVERTISERS' INDEX

12

## CREDITS

13

## CD CONTENTS

16

## CD INFORMATION

183

## CONTACT INFORMATION 15, 183

## WORKSHOP

139

## CONTENTS

Contest: Bug of the Month 139

## TECH TALK

Technobabble: Deciphering DVD. 140

By Nathan Taylor

Step by Step: Search engines. 144

By Daniel Rutter

## OPERATING SYSTEMS

Windows 95: Alternative shells. 146

By Kieran McNamee

OS/2: Harnessing the power of the command prompt. 148

By Christopher Relf

Thinking of upgrading? Don't want to wade through volumes of expensive books looking for the right guide? Look no further! The *Windows 98 Pocketbook* has everything you need and nothing you don't.

**On sale NOW!** at your favourite newsagency.

Mac OS: Office 98 and beyond. 150

By Stephen Withers

Linux: Red Hat Package Manager. 152

By Geoffrey Bennett

## PROGRAMMING

Developers Corner: The intricate science of pointers. 154

By Michael Smith

JavaScript: Abstractions, complexities and other philosophical issues. 156

By Travis Simon

HyperText: Time-saving tools. 158

By Lee Borkman

## SHAREWARE

160





## YOUR BUSINESS CAN NOW AFFORD A WHOLE NEW IMAGE.



With an incredible 2400 dpi class colour, images printed from the Brother HL-2400C are as good as the real thing. Gone are the days of the slow ink jet printer. Printing 4 pages per minute in full colour and 16 pages per minute in black and white, the Brother HL-2400C is faster than other more expensive laser printers.

With these great features and a low price you'll save money, time and interior decorating costs.

Contact your local Brother state office for your nearest stockist.

**brother**<sup>®</sup>

You can always rely on your brother.



## Advertising index

3Com	87	Intel	4, 5, 80, 81, 83	Panasonic	25	Q Plus	164
American Power	111	IPL Datron	109	PowerQuest	121	Optima	165
ASP	113	KOA	78	Ricoh	71		
Beyond	119	Kodak	75	Samsung		<b>SUPERMARKET</b>	
Brother	11	LG Electronics	89	Electronics	131, 147, 149	Dietner	167
Canon	35, 37, 39, 41, 43, 45, 47	Macase	28	Servex	9, 63, 101	City Software	168, 169
Corel	IBC	Magtron	132	Sony	67	New Reality	170, 171
Cybec	106, 108, 110	Micrografx	104	Super Network	76	National Communications	172
Daewoo	31	Microgram	197	Teco	127	DMA	173, 174
Data Expert	125	Microstar	207	Telstra Big Pond	2, 3	Sigmacom	175
Dell	IFC, 1, gatefold, 21, 59	Mira Networking	12	TPGI	OBC	Dragon Dictate	176
Diamond MM	73	Mitsubishi	69	Viewsonic	56	Take 7	177
Dymocks	49, 51, 53, 55	Mycom	107	Westan	19	Australian Corporate	
Epson	95	Natcomp	85	Yamaha	64	Technologies	178
Fujitsu	61	NEC	23			Intelligent Printing	179
Gateway	13, 14	Net Registry	116	<b>CHANNEL</b>		Rosemary Media	180
Hearne	97	Netspace	33	AVO	161	Corporate Software	181, 182
Hyundai	77	Ocean Office	142, 143	Global Business	162		
		Optima	27, 99	Edge	163	<b>MARKETPLACE</b>	<b>184-193</b>

Is it *possible* to love **your** Internet Service Provider?

*According to our customers, yes. In a recent survey of our dial-up and corporate customers, we scored terrifically well on customer satisfaction.*

"Why go anywhere else?", "No reason to move!" were consistent comments. But the one that speaks volumes about the quality of our service came from a professional computer consultant:

"I always recommend Mira to my customers because I never get any complaints back from them." (Thank you, and by the way, your cheque is in the mail!)

So what is it that makes Mira different from other ISPs? We believe it's the fact that our business is structured to provide our customers with top quality service.

We do this through:

- a 7 day a week Help Line, staffed by an enthusiastic, "can do!" team
- a "no busy signal" policy
- rapid connections and downloading of data
- pricing plans that are simply great value.

Like to know more about how we can be of service to you? Call Mira today. It could be the start of a wonderful relationship.

Melbourne Sydney Brisbane connections call **1300 360 080**

7 days 9am - 8pm weekdays, 2pm - 5pm weekends

Email: [sales@mira.net](mailto:sales@mira.net)



**MIRA  
NETWORKING**

Established 1991



## Editorial

**Editor**  
(02) 9288 9113  
**Deputy Editor**  
(02) 9288 9122  
**Features Editor**  
(02) 9288 9163  
**Creative Director**  
(02) 9288 9127

Jeremy White  
jwhite@acp.com.au  
Richard Rodrigues  
rrodrigu@acp.com.au  
Helen Dancer  
hdancer@acp.com.au  
Darren Waldren  
dwaldren@acp.com.au

**Sub-Editor/Journalist**  
(02) 9288 9132

Lindsay Hayman  
lhayman@acp.com.au

**Sub-Editor**  
(02) 9288 9126

Vanessa Richardson  
vrichard@acp.com.au

**Journalist**  
(02) 9288 9175

Nathan Taylor  
ntaylor@acp.com.au

**Journalist**  
Selina Mitchell  
smitch@acp.com.au

**Journalist**  
(02) 9288 9104

Roulla Yiacoymi  
ry@acp.com.au

**Journalist**  
(02) 9288 9188

Ashton Mills  
amills@acp.com.au

**Journalist**  
(02) 9288 9130

Simon Vandore  
svandore@acp.com.au

**Journalist**  
(02) 9288 9116

Josh Gliddon  
jgliddon@acp.com.au

**Journalist**  
(02) 9288 9177

Claire Waddell  
cwaddell@acp.com.au

**Contributing Editors**  
Jeremy Torr,  
Dan Tebbutt

**Contributors** Jeremy Horey, Bruce McCabe, Philip Argy, Julian Ehrlich, Jim Endersby, Cathie Kennedy, Lee Borkman, David Nourse, David Braue, Michael Smith, Ari Weisz-Koves, Travis Simon, Gareth Jones, Daniel Rutter, James Morris, Christopher Relf, Kieran McNamee

**Chief Sub-Editor**  
(02) 9288 9125

Michele Roach  
mroach@acp.com.au

**News Editor**  
(02) 9288 9172

Angus Kidman  
akidman@acp.com.au

**Technical Editor**  
(02) 9288 9121

Steven Fear  
sfear@acp.com.au

**Artist**  
(02) 9288 9190

Lisa Gould  
lgould@acp.com.au

**Editorial Coordinator**  
(02) 9288 9123

Kim Edwards  
kedwards@acp.com.au

**New Media Coordinator**  
(02) 9288 9105

Helen Duncan  
hduncan@acp.com.au

**Melbourne Bureau Chief**  
Stephen Withers  
swithers@ozemail.com.au

**apcmag.cd Editor**  
(02) 9288 9109

Andrew Broadhead  
andrewb@acp.com.au

**apcmag.cd Coordinator**  
(02) 9288 9110

Josh Mehlman  
jmehlman@acp.com.au

**Web Production Assistant**  
(02) 9288 9190

Alex Kidman  
alexk@acp.com.au

**Technical Assistant**  
(02) 9288 9110

Jackson Chan  
jchan@acp.com.au

**Technical Assistant**  
(02) 9288 9110

Claudius Kumar  
ckumar@acp.com.au

Material contained within Australian Personal Computer is protected under the Commonwealth Copyright Act 1968. No material may be reproduced in part or in whole without the written consent of the copyright holders.

## Advertising

**National Advertising Mgr**  
(02) 9288 9120

Mark Harrison  
mharriso@acp.com.au

**Senior Account Manager**  
(02) 9288 9143

Sumit Roy  
sroy@acp.com.au

**Senior Account Manager**  
(02) 9288 9149

Alison Watson  
awatson@acp.com.au

**Account Manager**  
(02) 9288 9157

Justin Cain  
jcain@acp.com.au

**Vic & Tas Sales Manager**  
(03) 9823 6382

Julie Dominguez  
julied@acp.com.au

**Sales QLD**  
(07) 3000 8500

Noel Fitzpatrick

**Sales WA**  
(09) 9481 4127

Diane Slade

**Sales SA**  
(08) 8212 9599

Sandy Shaw

**Marketplace**  
(02) 9282 8904

Morag Kerr

**Advertising Production**  
(02) 9282 8626

Alison Miller

## Publishing

**Group Publisher**

Paul Dykzeul

**Managing Director**

Colin Morrison

**General Manger**  
**Computer Publications**

Michael Udabage

**Group Sales Director**  
(02) 9288 9158

David O'Sullivan  
dos@acp.com.au

**Marketing Manager**  
(02) 9288 9164

Stephen Dolan  
sdolan@acp.com.au

**Business Development**  
**Manager New Media**  
(02) 9288 9192

Matt Bateman  
mbateman@acp.com.au

Standard subscription rate:  
Australia \$65 per annum.

Distributed by Network Distribution Company,  
54 Park Street, Sydney, 1028.  
Telephone: (02) 9282 8777

Australian Personal Computer Magazine is  
published by ACP Computer Publications, a division  
of ACP Publishing Pty Ltd (ACN 053 273 546)

Printed by Hannanprint Pty Ltd.

## Coming up

- The latest in office application suites from the big three go under the APC Labs' microscope, along with PCI soundcards and AGP graphics cards.
- Our special report on the state of technology in the strong and the struggling economies of South-East Asia. How does Australia fare as competitor and trading partner?
- New developments in multimedia instruction sets and means of Internet gambling form APC's technical focus this month.

## Legend

For articles which have extra material on our Web site, <http://apcmag.com>, or related software on this month's cover CD, **apcmag.cd**, look for the following symbols at the top of each page:

⊕ means there is extra material, background and links on our Web site.

⦿ means that software referred to on this page can be found on this month's cover CD.



## Subscription information

Toll free: 1800 252 515  
Sydney/international: 612 9260 0091  
Email: [subsquery@acp.com.au](mailto:subsquery@acp.com.au)

Subscribe and pay 25% less than the newsstand price. One year for only \$65. For full details see our subscription ad on pages 128-129.

Reprints (02) 9288 9164 or  
email: [hmliley@acp.com.au](mailto:hmliley@acp.com.au)  
Back issues (02) 9288 9123

For a full listing of submission information, contact details and back issues, please see page 183.



# Let's talk about *your* options.

Gateway provides computer enthusiasts with the most up to date computing technology at extremely competitive prices. Not only that, we offer all our customers an unbelievable range of options which help tailor your new Gateway to your specific needs.

## Let's talk about Desktops.

With a multimedia heavyweight like the G6-400XL, hours of hard core gaming can be yours. Packing the formidable Pentium® II Processor, the high end G6-400XL comes with a 12Mb Voodoo Card- the most superior 3-D gaming technology available. If this isn't exactly what you're after, relax. Gateway's huge range of products and build-to-order capability enable you to create your dream machine. Call us and let's talk about *your* Gateway.

### A few of your options

#### G6-300 The All Rounder

The perfect entry-level system, priced to please.

Processor	• Intel® Pentium® II Processor 300MHz
Memory	• 32MB SDRAM
Monitor	• EV500 15"
Video	• STB Mpack 2 4MB AGP Graphics
Hard Drive	• 2.5GB Ultra ATA
Optical Storage	• min 13X / max 32X
Sound	• Ensoniq Audio PCI Wavetable
Speakers	• GCS-100
Modem	• x2 Technology • Telstra Big Pond® Internet kit+50 hours free access

Operating System  
Application Software

• MS® Windows '98  
MS Office SBE+

PRICE **\$2399** inc tax  
or as low as \$21 per week

#### G6-350 The Tower of Power

The affordable system with BX Chipset. Perfect for future upgrades.

Processor	• Intel® Pentium® II Processor 350MHz
Memory	• 32MB SDRAM
Monitor	• EV700 17"
Video	• 8MB AGP 2x 3-D NVIDIA RIVA 128ZX
Hard Drive	• 5GB Ultra ATA
Optical Storage	• DVD II ROM Drive
Sound	• Ensoniq Audio PCI Wavetable
Speakers	• GCS-100
Modem	• x2 Technology • Telstra Big Pond® Internet kit+50 hours free access

Operating System  
Application Software

• MS® Windows '98  
MS Office SBE+

PRICE **\$3699** inc tax  
or as low as \$32 per week

#### GP6-400 The Executive

The office workhorse with serious power.

Processor	• Intel® Pentium® II Processor 400MHz
Memory	• 128MB SDRAM
Monitor	• EV700 17"
Video	• 8MB Permedia AGP Graphics
Hard Drive	• 8.4GB Ultra ATA
Optical Storage	• min 13X / max 32X
Sound	• Ensoniq Audio PCI Wavetable

Operating System  
Application Software

• MS® Windows NT 4.0  
MS Office SBE+

PRICE **\$4199** inc tax  
or as low as \$36 per week

### Pick of the bunch...

#### G6-400XL The Ram Raider

The ultimate multi-media arsenal. Just read the specs and weep.

Processor	• Intel® Pentium® II Processor 400MHz
Memory	• 128MB SDRAM
Monitor	• VX900 19"
Video	• 8MB AGP 2x 3-D NVIDIA RIVA 128ZX • 12MB 3-D fx™ Voodoo 2 3-D Accelerator
Hard Drive	• 14.4GB Ultra ATA
Optical Storage	• DVD II ROM Drive
Sound	• Ensoniq Audio PCI Wavetable
Speakers	• Boston Acoustic Media Theatre
Modem	• x2 Technology • Telstra Big Pond® Internet kit+50 hours free access

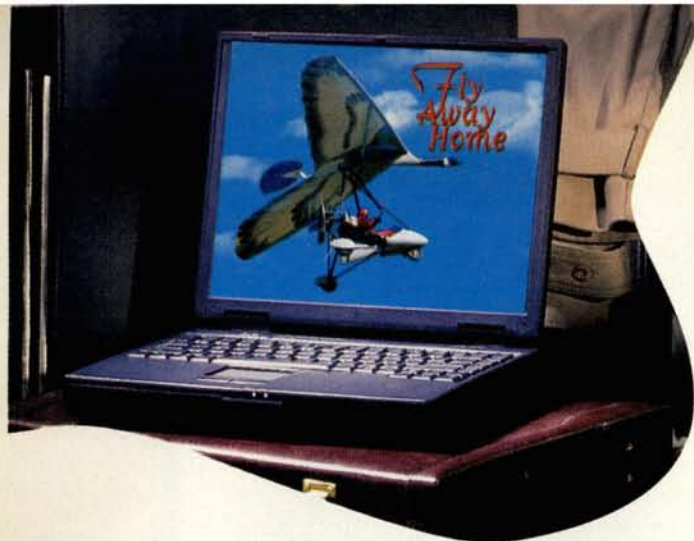
Operating System  
Application Software

• MS® Windows '98  
MS Office SBE+

PRICE **\$5999** inc tax  
or as low as \$50 per week







## Let's talk about Notebooks.

Your options shouldn't be limited just for the sake of portability. For the first time, Gateway offers you the unique ability to choose which processor, memory and hard drive you want. The Solo 9100XL is a classic example. A serious PC built just for you and made to travel.

### A few of your options

#### Solo 2500SE The Mighty Mouse

The ideal start-up portable PC for those with the travel-bug.

Processor	• Intel® Pentium® Processor w/MMX™ Technology 200MHz
Options	[Intel® Pentium® II Processor 233MHz or 266MHz]
Memory	• 32MB SDRAM
Options	[64MB, 128MB]
Monitor	• 12.1" High Performance Addressing (HPA) SVGA
Video	• 2MB EDO
Hard Drive	• 2GB Ultra ATA
Options	[3GB, 4GB, 6GB]
Diskette Drive	• Integrated 1.44MB
Optical Storage	• Integrated 8xMin/ 20xMax CD ROM
Modem	
Operating System	• MS® Windows 98
Application Software	
PRICE	<b>\$3299</b> inc tax or as low as \$29 per week

#### Solo 5150SE The Pocket Rocket

Seriously thin, seriously light. And oh what a view!

Processor	• Intel® Pentium® Processor w/MMX™ Technology 233MHz
Options	[Intel® Pentium® II Processor 233MHz or 266MHz]
Memory	• 32MB SDRAM
Options	[64MB, 144MB]
Monitor	• 14.1" Active Matrix (TFT) SVGA
Video	• 2.5MB SGRAM
Hard Drive	• 2GB Ultra ATA
Options	[3GB, 4GB, 6GB]
Diskette Drive	• Modular 1.44MB
Optical Storage	• Modular 8xMin/ 20xMax CD ROM
Modem	
Operating System	• MS® Windows 98
Application Software	MS® Office SBE+
PRICE	<b>\$4299</b> inc tax or as low as \$37 per week

#### Solo 9100LS The Power Trip

It's got the lot, and it means business.

Processor	• Intel® Pentium® II Processor 233MHz
Options	[Intel® Pentium® Processor w/MMX™ Technology 233MHz or Intel® Pentium® II Processor 266MHz]
Memory	• 64MB SDRAM
Options	[32MB, 192MB]
Monitor	• 14.1" Active Matrix (TFT) XGA
Video	• 4MB SGRAM
Hard Drive	• 4GB Ultra ATA
Options	[3GB, 6GB]
Diskette Drive	• Combination 1.44MB
Optical Storage	• Combination DVD/FDD
Modem	• TDK 56k Modem
Operating System	• MS® Windows 98
Application Software	MS® Office SBE+
PRICE	<b>\$6299</b> inc tax or as low as \$53 per week

### Pick of the bunch...

#### Solo 9100XL The Takeaway

It doesn't get much better than this.

Processor	• Intel® Pentium® II Processor 266MHz
Options	[Intel® Pentium® II Processor 233MHz]
Memory	• 128MB SDRAM
Options	[64MB, 192MB]
Monitor	• 14.1" Active Matrix (TFT) XGA
Video	• 4MB SGRAM
Hard Drive	• 8GB Ultra ATA
Options	[3GB, 4GB, 6GB]
Diskette Drive	• Combination 1.44MB
Optical Storage	• Combination DVD/FDD
Modem	• TDK 56k Modem
Operating System	• MS® Windows 98
Application Software	MS® Office SBE+
PRICE	<b>\$8299</b> inc tax or as low as \$69 per week

**All Solos Have:** • 12-cell Lithium Ion battery (8-cell Nickel Metal Hydride in Solo 2500 SE) • EZ PAD - Touchpad Point Device • Casual Case (Executive Leather Case with the Solo 9100XL) • CRT, Parallel/FDD, PS/2, Serial, USB, Line In & Out, Fast IR, and Docking Ports (NTSC/PAL out on Solo 2500SE & Solo 5150SE) (NTSC/PAL In & Out on Solo 9100LS & Solo 9100XL) • 16-bit Stereo Sound • Stereo headphone • 512k Cache (256 K in Solo 2500SE) • Telstra Big Pond® Internet kit + 50 hours free access, included with modem only.

### HELP!

All Gateway desktops and notebooks include • 3 year warranty\*\* • 30 day customer satisfaction guarantee • Lifetime toll free phone support on hardware and operating systems • Extended warranty options available.



Let's talk about your



**Gateway**™

[www.gw2k.com.au](http://www.gw2k.com.au)

# call 1800 500 734

Our sales hotline is open Monday to Friday 9am-6pm and Saturday 9am-5pm (EST).

Take a look...

• 225 Clarence St, Sydney • 398 Lonsdale St, Melbourne  
• 47-79 Elizabeth St, Brisbane • 938 Hay St, Perth

©1998 Gateway 2000, Inc. All rights reserved. Gateway and the stylised logo are trademarks of Gateway 2000, Inc. Prices include tax but exclude freight, handling and insurance. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. MMX is a trademark of Intel Corporation. All brands and product names are trademarks of their respective companies. Product shots for illustrative purposes only. Subject to Gateway 2000 warranty terms and conditions. You will need a valid credit card to access the Telstra Big Pond Business service. 50 hours must be used within 2 months of registration. Big Pond is a registered trade mark of Telstra corporation Ltd. Normal telecommunications charges apply. \*\* Hardware only \*Rentals based on 5 years excluding stamp duty and FID which varies from state to state. Rentals available only to approved registered business. • Denotes standard configuration for advertised price. McCANN GATE002I/APC



**apcmag.com****This month on APC's Web site****WE WANT YOUR VOTE!**

It's almost time for the 1998 Telstra/AFR Australian Internet Awards. If you find **apcmag.com** a useful resource, please support us by voting in the Most Popular Site category.

<http://apcmag.com/vote>

**WORKSHOP WORKOUT**

Each month, Workshop brings you the information you need on how to accomplish key tasks of a technical nature — from coming to grips with a new operating system to developing your own funky JavaScript applets. Better yet, the **apcmag.com** site allows you to access a full archive

of articles published in the section, and search for that elusive hint on how to change the Windows 95 start-up screen.

<http://apcmag.com/workshop/>

**HOLD THE FRONT PAGE!**

**apcmag.com's** daily news is the ideal way to stay up-to-date with technology trends between issues of the magazine, offering the only 100% Australian IT news service on the Web. It also features regular columns and a weekly email update summarising the week's headlines, and we've got some exciting changes planned in the months ahead. Watch this space!

<http://apcmag.com/news/>

**A BETTER LIFE**

Each month, APC's Reprogramming column looks at the impact of technology, and ways in which we can use it more effectively and with less damage to ourselves and the environment. You can find a complete archive of the column online.

<http://apcmag.com/reprogramming/>

**TALK TO US**

APC's Web site offers you the easiest way to get in direct contact with the writers and staff of the magazine. Got a suggestion for an article? A comment on something we've published? We want to hear it. Use our feedback form for general comments. You can also email the author of any article on the site simply by clicking the 'Email Writer' button.

<http://apcmag.com/feedback/>

**GOING IN HARD**

Continuing our tradition of running Web-only features, this month **apcmag.com** features a comprehensive Labs test of seven high-capacity drives.

<http://apcmag.com/reviews/9809/hd.htm>

**GAMES PEOPLE PLAY**

Go on, admit it. You may be a serious business user during the day, but when the lights go down your PC is echoing to the sounds of gunfire, revving motors and bouncing balls. Make sure you're choosing the right games by checking out our archive of reviews and news.

<http://apcmag.com/games/>

Plus, don't forget our regular reviews of newly released products, exclusive Web-only features, and a complete archive of articles from APC's print edition. All this and more at **apcmag.com**, your one-stop, 100% Australian computing resource online.

**nineMSN**

**apcmag.cd****This month on APC's cover CD****PRIME TIME**

Video, audio and multimedia hit the big time on your desktop. Plus self-help tools for the TV generation!

**FOR YOUR VIEWING PLEASURE**

Fifteen top multimedia viewers and editors. Manipulate, display and play files in just about any format.

**IMPROVE YOUR IMAGE**

Give your life a facelift with these programs to aid physical and intellectual self-improvement.

**LINUX: THE PENGUIN GOES PRIME TIME**

Over 30 awesome applications to help you join the Linux revolution.

**THE IMAGE MAKERS**

Professional image editor trials and demos.

**Plus:** Create video from your desktop with Adobe Premiere.

**THEMEZONE**

All the latest themes for Windows, Mac and Linux.

- 20 great TV themes for Windows
- 24 Kaleidoscope themes for Macs

- Over 125 new programs and 20 updates

**Plus:** Netscape Communicator 4.5 PR 1

**Hottest new downloads including:** Norton Mobile Essentials ■ CyberKit 2.3



- Adobe Premiere 5 ■ PIRCH98 1.0.1.1190 ■ Audiograbber 1.21
- NeoPlanet 1.5G ■ Powermarks 3.01
- Electronic Assistant 2.0 Lite ■ CD-DA Extractor 2.10 ■ Cassandra Encryption System 1.1a

See under the cover flap for a complete list of programs.



## LINUX BOOM

### Open source gets respectable

Open source software is no longer just for geeks. Increasing levels of enterprise support, both among users and within major software developers, mean that business desktops are no longer out of the reach of products that don't come from traditional OS or applications suppliers.

Open source refers to software developed by sharing source code on the Internet, so developers worldwide can contribute programming and iron out bugs. The best-known example of an open-source product is Linux, the cooperatively developed Unix variant.

Open source software is now readily accepted in corporate circles, according to new research conducted by Sun-World in the US. The online magazine reported that an astonishing 94% of enterprises are prepared to trust freeware from the Internet for mission-critical functions, while 69% of organisations regard open source tools as "very important" to their IT work.

Three-quarters of enterprises have defined policies for

Continued on page 18

## SECURITY WOES AND SLOW ROLLOUTS

### Net banking faces hurdles

**W**hile Australian banks are increasingly turning to the Internet to offer banking services, slow rollouts and security problems are likely to delay mass uptake of the services.

Many Australian banks are still holding back on fully developing banking services online, preferring to wait until the success of Net banking pioneers can be measured, a KPMG survey has found.

The *Internet Home Banking Survey* has found there is a lack of consensus among banks on the extent to which the Internet will affect retail banking.

Some banks believe the implementation of Internet banking will be cheaper and easier in the future due to vendor developments and economies of scale as a critical mass of users emerges. "Banks want to be first, second," said KPMG's Banking and Finance Industry Group chairperson John Buttle. Of the 12 banks surveyed, only two rated Net banking as a priority today, while a further eight considered it a priority in the next

#### On demand or no demand?

Lack of consumer demand has been cited as a significant factor behind Australian banks' slow uptake of Internet technologies.



About 1.5 million Australians have Internet access, but according to [www.consult.com.au](http://www.consult.com.au) data, at the beginning of 1998 only 95,000 Internet users had tried Net banking, and half of them used it on a regular basis.

The Commonwealth Bank had the most online customers: 46,000, including 27,600 regular users.

three to five years (two declined to respond to that question).

The survey found Australian banks see Internet banking as both a threat and an opportunity for growth.

Of the 'Big Four', only the National Australia Bank has failed to establish online banking transactions, although it recently announced it expects to launch a full service in October this year. Westpac launched its service in June 1998, and was the first Australian bank to provide a browser-based service. Buttle said the bank was "very slow

to start, but it's now got quite a strong offering".

The relative slowness with which large Australian banks are setting up Internet banking services is largely due to the problem of integrating front-end software with their back-end systems. Meanwhile, a paper presented at SEARCC 98 in Darwin in July has called into question the security of at least two Australian online banking services.

The paper, *The Problems with Secure On-line Banking*, was prepared by Tim Redhead

Continued on page 18



#### News Roundup

Database software developer Ardent Software has announced plans to open Asia-Pacific headquarters in North Sydney, as part of a newly signed Fixed Term Agreement (FTA) with the Federal Government that will see up to \$13.8 million spent on research and development and \$15.3 million on the establishment of the new headquarters.

Under the FTA, Ardent will also commit to creating \$34.9 million in exports over the next four years. The existing R&D staff of 22 will be expanded to develop new products, which will be marketed via local and international software and integration partners. The regional HQ will manage business across the region, including China, Japan, Malaysia, India, Hong Kong, New Zealand, Korea and Singapore.

Fairfax is hoping to break the longstand-

ing dominance of IT jobs advertising by its rival News Ltd with the launch of a new Web site aimed exclusively at IT recruitment. The site, IT Jobs, offers information on technology jobs sourced directly from 10 major recruitment firms. Job seekers can email résumés directly to these firms, and can also place jobs in which they are interested into a 'Job Basket' before applying online.

While the official launch emphasised Fairfax's interest in pursuing new online



## Open source gets respectable

Continued from page 17

open source software, and only 1% actually impose a blanket ban, the survey found. SunWorld editor Carolyn Wong said the poll dispels the notion that freeware tools are not trusted among corporate IT managers.

Indeed, mass debugging may make open source tools more reliable than proprietary applications, the SunWorld survey suggests. Thirty-one percent of respondents had downloaded patches within



the previous month. "Open source fixes are much more readily available than those for proprietary code, offering users the flexibility to tailor programs, make modifications, expand the code, or otherwise customise it to their needs," said Wong.

A growing number of enterprise software companies are committing to port their software to Linux, giving a new aura of credibility to the increasingly popular open source OS.

Netscape and Oracle have both firmed up their plans to offer Linux versions of their server products. Having announced plans earlier this year to focus on the Linux market, and with a Linux version of Communicator 4.5 already available, Netscape now plans to release versions of its Messaging Server and Directory Server for Linux in 1999.

Oracle meanwhile has begun work on porting both its Oracle8 database and Oracle Applications to Linux.

The company plans to offer the software online for a 90-day trial period by the end of this year. "Oracle on Linux will provide a compelling alternative to Windows NT for companies that want an Internet-based, low-cost point of entry for Web-enabling their business," Oracle's System Products division executive vice-president Gary Bloom said in a statement. Computer Associates and Informix have also announced plans to produce Linux versions of their products.

IBM has also jumped on the open source bandwagon, releasing the code it will use to incorporate Public Key Infrastructure (PKI) in a range of its server products.

**Angus Kidman and  
Dan Tebbutt**

## Net banking faces hurdles

Continued from page 17

and Dean Povey from the Security Unit of the Queensland University of Technology's Distributed Systems Technology Co-operative Research Centre.

In the paper, Redhead and Povey discuss the ease with which they were able to obtain customer PINs (personal identification numbers) via the electronic banking services provided by two Australian banks. The banks in question were not named.

The security breaches occurred on the customer platform, in this case Microsoft's Windows 95, not in communications between the customer and the bank.

The banks in question used an Internet banking model where customers download executable files from the bank's Web site, precompiled for a number of common platforms. The running executable provides the customer interface as well as the communications security.

Despite the ease of their hack, Redhead and Povey said that designers of both applications seemed well aware of the possibility of the proposed attack.

"The scary thing about these attacks is not that they were possible, but that they were so simple, and that they were so simple despite the fact that steps had been taken to specifically prevent

them. Using freely available source code we were able to circumvent the security of these systems in an extremely short space of time."

One of the banks fixed its security loophole a short time after it was notified of the problem, Redhead said.

Rather than being negative about the discovery, the paper discusses possible solutions for such security flaws. These include single-use passwords, token-based authentication, and an 'atomic authentication scheme', which seeks to emulate the security of smart cards in software.

The KPMG survey reviewed the Web sites of 12 banks and found them "generally much less customer-friendly and less feature-rich than overseas bank sites". Banks are not taking advantage of the interactivity of the Net; and Buttle criticised banks' Web sites, "as they are supposed to be a window to the institution, and those windows are a little foggy".

When asked how much they were spending on their Web sites, banks gave KPMG responses ranging from \$5,000 to \$15 million. The study found that design and technical problems plague banks' Web sites; one site had 100 out-of-date link references, and another contained information that appeared to be three months old.

**Claire Waddell and  
Steven Fear**



### News Roundup

ventures, company officials make no secret of the fact that grabbing some of News Ltd's job advertising revenue is the main goal. "That's the whole point," Mike van Niekirk, IT editor of *The Age*, told APC.

● In a move to protect its market share in Australia, OzEmail has begun beta testing a new instant messaging service. The package, known as Buddy, has a similar func-

tionality to ICQ and AOL's Instant Messenger, allowing users to send messages to each other in real time online and using a 'buddy list' to notify them when people they know are online.

AOL recently acquired Mirabilis, the developer of ICQ. AOL plans to launch an Australian service by Christmas this year, and is considered a threat to OzEmail's position as the dominant ISP in Australia — a factor the company itself acknowledges. In related news, Microsoft has also

announced plans to begin beta testing an instant messaging system, MSN Messenger Service. Trials of the service began in August.

● The board of directors of Australian telecommunications manufacturer JNA has recommended accepting a \$114 million buyout offer from Lucent Technologies. Lucent has offered \$3.75 a share, and plans to use JNA to extend its presence in the Australian market, particularly with large customers such as Telstra. Managing



Tomorrows technology. Todays price. **The Voyager™**



3 YEAR  
ONE-TO-ONE  
WARRANTY



## Leading the world in Technology.

- Ultra DMA, • 512k Segmented Read/Write Cache Buffer
  - 173 Mbits/sec Max Data Rate • 5400RPM • 3.2 GB per platter
  - 500,000 Hours MTBF (POH) • Error Correction on the Fly,
  - EPR4 Read Channel with 16/17 rate code. *quiet as a mouse.*
- "Samsung - Channels' Choice for Hard Drives"***



For more information call your nearest distributor, VIC Crown System Ph (03) 9376 0166. Chelseasprings Ph (03) 9761 0044. NSW: Datavell Ph (02) 9748 8688. GPE Ph (02) 9318 0688. APD Ph (02) 9737 8277. QLD: Concorde Computers Ph (07) 334 3855. JLC Ph (07) 844 4519. S.A Legend Ph (08) 8374 2355. W.A: WA Data Ph (08) 9249 3622. Trinx Computers Ph (08) 9351 8799. Westan; VIC; Ph (03) 9563 6775 Fax (03) 9563 6836. NSW; (02) 9417 2133 Fax (02) 9417 2311. QLD; Ph (07) 3846 5522 Fax (07) 3846 5544. S.A; Ph (08) 8364 5000 Fax (08) 8364 5211. W.A; Ph (08) 9445 9688 Fax (08) 9445 9699.



## TIME BOMB TICKING

## Y2K warnings intensify

**A**s the turn of the century draws ever closer, concerns about the preparedness of companies to deal with the millennium bug are growing, but the news isn't all bad. A number of recent surveys show that Australia is largely on track with preparations for dealing with Y2K problems.

A meeting of regional experts at the SEARCC 98 conference in Darwin rated Australia's preparedness high relative to its neighbours. "Every country is exposed to the year 2000 problem, and it is critical that we cooperate and support each other as much as possible in sharing information," said SEARCC secretary-general, Robert Iau.

In addition, Australian banks and financial institutions' Y2K preparations are on track, according to findings by the Reserve Bank of Australia (RBA).

A report on the result of the second RBA survey of Australian banks' preparedness for Y2K estimates that the renovations and internal testing of critical bank IT systems will be completed by the end of 1998, and external testing will be conducted for the majority of 1999.

However, small-to-medium enterprises (SMEs) that have not taken adequate steps to

address Y2K problems may find it difficult to obtain lines of credit and other funding as the millennium rollover approaches.

Australian Bankers' Association associate director Ross Robbins said assessing Y2K preparations was part and parcel of the usual risk assessment any financial institution would undertake when deciding to lend funds to a business. "If a company hasn't done anything about Y2K, then it says something about the company and the people that are running it," Robbins said. "In the end, someone has to make a judgement about whether a business is a good risk."

Experts are also warning that testing makes up 80% of Y2K preparation, and that companies will need extra staff well beyond 2000 to deal with the problem. Initial estimates that testing will take up 60% of Y2K preparation time were wrong, said Meta Group director of enterprise data centre strategies, Carl Greiner.

Now that a million lines of code a day can be fixed with automated tools, repair is less of a problem, but finding and retaining people with enough knowledge of enterprise applications is a real bottleneck.

**Steven Fear, Josh Gliddon and Simon Vandore**

## RESOURCES DRAIN

## Email: The latest office time waster

**P**ersonal email is shaping up to be as big a drain on business resources as personal phone calls during work hours, according to a new study by Morgan & Banks.

The volume of business email sent during office hours is virtually identical to the volume of personal email, at 35.3% and 35% of total email volume, respectively. The remaining 29.5% is classified as 'resource tool related', said Morgan & Banks director John Rawlinson.

"There's no real difference in the breakdown of email usage across occupation types or industries," said Rawlinson. "Management, sales/marketing, administration, secretarial and trades and manufacturers are all basically the same."

The study found the only real variation was between age groups; over-55s use email less for all types of correspondence than their younger colleagues.

Rawlinson said the proportion of time spent by employees responding to personal

and junk email was a significant drain on productivity. There was no correlation between the volume of business email sent and increased workflow or efficiency, he added.

"Some companies estimate that up to one worker day per week is lost because of non-business email," he said. "There's a need for workers to educate employees about effective use of email, without putting too many restrictions which may hinder the flow of useful information."

In related news, email users are also being warned to maintain tight security after a series of bugs were uncovered in popular email products. Both Microsoft's and Netscape's email clients have been revealed to be vulnerable to attack via the tags used to embed attachments in email messages. Fixes are being developed in both cases; the problem is a result of poor software design rather than inherent problems within the overall email infrastructure.

**Josh Gliddon and Angus Kidman**



## News Roundup

director Peter Davies characterised the buyout as inevitable. "In an industry that is rapidly changing and rationalising, JNA's limited global marketing resources and reach may make it difficult to achieve a sales volume of sufficient critical mass for the company to receive optimum return on its R&D investment," he said.

The buyout will be subject to

approval by the Foreign Investment Review Board.

• NCR plans to introduce new ATMs that use iris recognition rather than a pin number for security authentication. To use an iris-recognition ATM, customers first register a digital image of one iris with their bank. When using the machine, a customer inserts the bank card and stands facing a camera mounted in the terminal. If the iris matches the bank's record, the transaction proceeds.

Complete versions of these stories can be found on the **apcmag.com** Web site. For regular updates on what's happening in the world of computing, check out our breaking news stories throughout the week at <http://apcmag.com/news>. And don't forget our weekly Highlights from the Wire roundup, posted every Monday at <http://apcmag.com/direct> and available via email.



# THE BATTLE BETWEEN PRICE AND PERFORMANCE IS OVER. YOU WON.

Announcing the blistering speed of the Dell Dimension® 400MHz XPS R series. Power packed with the latest Intel® Pentium® II Processor 400MHz.



## DELL DIMENSION® XPS R400

- Intel® Pentium® II Processor 400MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- NEW 8MB AGP Video Card
- Turtle Beach Montego A3D64 Voice PCI Sound Card
- NEW 40X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 56K Capable U.S. Robotics X2 WinModem
- Telstra Big Pond Internet Starter Kit with 50 hours free Internet access\*
- 3 year limited warranty

**\$3,669\***

or \$32 per week\*\*

Upgrade options: 17" Trinitron® Monitor (16.0" v.i.s.) \$461, Iomega Zip 100MB Internal Drive \$188

## DELL DIMENSION® XPS R400

- Intel® Pentium® II Processor 400MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 32MB 100MHz SDRAM
- 6.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- NEW 8MB AGP Video Card
- Integrated Crystal Wavetable Sound
- NEW 40X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3 year limited warranty

**\$3,359\***

or \$29 per week\*\*

Upgrade options: to 8.4GB Ultra ATA Hard Drive \$56, from 32MB to 64MB 100MHz SDRAM \$94

## DELL'S WIRED!

You can custom-configure Dell PCs to your exact requirements with the latest technology at great-value prices – even order and make payment via our credit card secure WebStore! It's open 24 hours a day, so try it for yourself. We are constantly revising our prices and offering new products. Call today or visit our Web site for our latest product and price offers.

Visit [www.dell.com.au](http://www.dell.com.au)

## CALL DELL

Call Dell today, Mon-Fri 8am-8pm, Sat 9am-3pm (EST).



**1 300 303 126**

OR VISIT [www.dell.com.au](http://www.dell.com.au)

\*Prices and specifications subject to change without notice. All prices shown include tax and delivery is additional. Certain configurations can not be changed. Dell, the Dell logo and Dell Dimension are registered trademarks of the Dell Computer Corporation. The Intel inside logo and Pentium are registered trademarks of Intel Corporation. Microsoft, Windows 98 are registered trademarks of Microsoft Corporation. Other trademarks and trade names may be used in this document, refer to either the entities claiming marks and names or their products. Dell disclaims proprietary interest in the marks and the names of others. Dell is not responsible for errors in typography and photography. Photographed with options. For a complete copy of Dell's limited warranty offerings please write to Dell Computer Pty Ltd, Building 3, 14 Aquatic Drive, Frenchs Forest, NSW, 2086. \*\*Dell Financial Services offer rentals based on a 36 month term excluding stamp duty and FID which varies from state to state. Rentals and operating leases are available only to approved registered sole traders, partnerships and companies. Figures shown are indicative and may vary with interest rates. \*You'll need a valid credit card to access. 50 free hours must be used within the first month of registration. Normal Telstra charges apply. Copyright 1998 Dell Computer Corporation. All Rights reserved. DELL00032/APC/DIM/1



## CASHING IN

## IT salaries keep rising

If you're looking for a job with strong salary prospects, information technology is still the place to be, according to the latest remuneration survey by the Australian Computer Society (ACS).

In the 12 months to February 1998, IT salaries rose by an average of 5.2%, with a median base salary of \$64,100 and a median total package (including benefits) of \$73,448. Private sector workers did even better, receiving a 6.2% jump in pay. Government and education workers got a slightly smaller slice of the pie, rising 3.4% and 4.5% respectively.

Professionals working in management roles received a healthy median total package of \$103,037, while staff in sales and marketing were only just behind on \$102,862. Support workers had the lowest reported median salaries, around \$53,000.

The survey was based on the responses of 2,164 technology professionals across Australia, but only encompassed qualified workers.

Angus Kidman

## SEMINAR SERIES

## NOIE sells ecommerce

**T**he National Office for the Information Economy (NOIE) has commenced in earnest the task of selling the virtues of IT-enabling business to the public.

NOIE has set up a series of regional summits as part of its efforts to increase awareness of the benefits of the information economy. Summits have already been organised for Bunbury and Mandurah in WA as well as Penrith in NSW, and more are to be finalised soon.

The regional plan was announced at the launch of NOIE's latest strategy document, *Towards an Australian strategy for the information economy*. Feedback on the national strategy will be collected at each summit.

The Government has said it is particularly interested in rural input for three initiatives mentioned in the strategy:

- Ensuring that Australians are aware of online choices and the information economy's opportunities, and have the confidence, skills and understanding they need to participate.
- Ensuring that every Australian has access to afford-

## Guiding principles

*Towards an Australian strategy for the information economy* lists four guiding principles that should be followed when devising future technology strategies:

- All Australians need to be able to access the information economy.
- The private sector must lead in all major areas.
- National approaches must be designed in line with international concerns.
- The role of government is to develop a regulatory framework and to utilise technology itself as a showcase provider of information.

able online services relevant to their individual needs.

- Ensuring school leavers are equipped with the online skills and knowledge they need to benefit from employment and other online opportunities.

NOIE CEO Dr Paul Twomey noted that general press coverage of the launch of the summit series had been less than NOIE had hoped.

"In the press coverage, IT is bad because it loses people their jobs," Twomey said. However, jobs growth in IT-related areas increased 10% between the 1988/1989 and 1996/1997 financial years,

compared to overall jobs growth of 7% in this period; while the demand for IT-skilled workers is growing five times faster than GDP, he said.

A key role for NOIE will be ensuring that national standards in areas such as security and communications are adopted, Twomey noted. "We basically screwed up the steam age," he said, recalling the gauge differences that made a national rail system effectively impossible. "The commitment is that we don't screw up the information age."

Selina Mitchell and  
Angus Kidman

## LEGAL MESS

## Copyright copies past mistakes

**M**oves to directly transfer copyright assumptions and laws from the print world to the electronic sphere could prove costly, a senior librarian has warned.

"The world of digital information is upon us and evolving at speeds far faster than social, political and economic analysis can handle — and certainly far faster than legislative processes can respond," said Dr Lynn Allen, CEO and state librarian for the Library and Information Service of Western Australia (LSWA) at the Copyright and the Electronic Image forum in Canberra in August.

She suggested that broadly defined policy principles and mutually beneficial operating guidelines would be a more sensible solution to electronic copyright. Government policies for online copyright are currently being drafted.

I have some concerns as to whether we have had a realistic enough discussion on the meaning of the electronic world and what should be the response of cultural institutions," Allen said.

"I want to suggest to you that copyright holders and librarians may not have the model right in the print world, that we are operating on a series of assumptions that can be challenged and

demonstrated to be flawed," said Allen. "So why should we seek to transfer these assumptions into the electronic world? We are proceeding blindly down a path of debating these paradigms without seeking new ones for the electronic world.

"I am not eager to repeat the technological errors of judgement evidenced by the video disc or Betamax, nor to put my faith blindly in technologies which may disappear like the telex machine and the gestetner duplicator. It is one thing to use these technologies. It is another thing entirely to rely on them for the heartbeat of a nation's culture."

Selina Mitchell



# YOUR DAY 19th August, 1998 CONNECTED.

NEC NOTEBOOKS, MOBILE PHONES & COMPUTERS...



...HELP YOUR CHILDREN CONNECT...



...TO THE WORLD OF MULTIMEDIA.



Through multimedia your children are learning to communicate. That's why a growing number of parents, schools and centres for learning are choosing leading edge multimedia products – NEC's advanced monitors, servers, desktops and notebooks. NEC is defining and helping Australians everywhere realise the integration of voice, data and video technologies, the key ingredients of multimedia.

Connect with NEC to Multimedia. For information, call NEC on 131 632.

just imagine  
NEC MULTIMEDIA

**NEC**



*Economic crisis provides opportunity for the IT sector,  
but there are many problems to overcome.*

# Can Australia redefine its role in Asia?

**C**oncerns over the performance of technology companies in the Asia-Pacific region could be good news for the development of Australia's own IT industry, but the future of our role as a regional technology centre is far from clear.

Multinational firms continue to cite ongoing economic problems in Asia as a major factor in depressed sales. Figures on global PC sales indicate sales in the region have been seriously affected. "All companies were hurt to some extent by poor performance in Asia-Pacific and Japan," said Dataquest analyst Scott Miller. Behind that broader trend, a host of individual companies have attributed losses or declining revenues to regional problems.

However, many Australian outposts of IT firms are bucking that trend. Companies as diverse as Bay Networks and Compaq have reported strong growth in Australia, despite depressed sales across the Asia-Pacific region as a whole.

Compaq announced in late July that sales targets for the Asia-Pacific region were being lowered. Regional managing director Paul Chan told Reuters that while the company expected to remain profitable through a mixture of cost-cutting initiatives, it was unrealistic to expect sales to remain at pre-1997 levels in the near future. Sales to end users have declined 15% overall in the Asia-Pacific market.

In Australia, however, the company's management is painting a very different picture. Sales for the second quarter were up 36% on the same period last year (Compaq does not provide revenue figures by region, but posted a net loss of \$US3.6 billion, largely due its recent acquisition of Digital).

Manufacturing volumes at the company's Sydney plant also rose by 20%. According to managing director Ian Penman, Compaq's local business is growing at three times the Australian PC market rate.

Compaq isn't the only company to find the Australian market something of a haven amid regional and global turmoil. Bay Networks reported a worldwide loss of \$US34.8 million for its 1998 fiscal year, but the local operation had its best-performing year ever, according to company officials.



In addition, while the Asian economic crisis is beginning to undermine employment opportunities, that problem is yet to strike information technology workers.

The latest Drake International Employment Forecast shows that 108,000 Australian jobs are expected to disappear in the July-September quarter, 4,200 of which are directly attributable to ongoing economic issues in Asia. However, the IT sector is bucking the trend; technology jobs are expected to grow by 2.45%.

Much of this growth can be attributed to continuing demand for staff skilled in Web development, especially ecommerce installations, and dealing with Y2K problems. Drake spokesperson John Troughton said many ecommerce operations expect demand to grow dramatically in the new financial year, as 90% of Australian businesses that are online are yet to install any ecommerce capabilities.

Australia's relatively strong performance in technology areas would suggest that companies looking to create a new foothold in the region might be more disposed to select Australia as a regional base. Lucent's recent bid to acquire JNA Communications was founded on such logic. The equation is complicated, however, by the growing popularity of One Nation, whose policies are firmly opposed to overseas investment.

Earlier concerns that One Nation's success in the recent Queensland elections could affect the development of the IT industry are gathering strength. Sabre Technology Solutions, which dominates the travel industry software market, has

indicated that the growing popularity of One Nation has made it less likely the company will set up a regional base in Sydney.

"Both Hong Kong and Sydney are on the short list for our new Asia-Pacific regional headquarters, but now I find it a difficult thing to say to a Chinese businessman that we are thinking of setting up our new regional headquarters in Australia," Sabre Asia-Pacific senior vice-president Peter von Moltke told *The Australian Financial Review*.

Not everyone is so pessimistic about broader regional prospects. The economic crisis makes it easier for companies to invest in Asia, said Network Associates Asia-Pacific director James LaLonde. Since its inception 18 months ago at the beginning of the crisis, Network Associates has developed a significant presence in the region. It now has 100 people working in Japan, 10 in both Hong Kong and Singapore, 30 in China and 40 in Australia. The company has achieved aggressive sales numbers, said LaLonde.

Already well positioned in Europe and the US, Network Associates needed to build on its market penetration in the Asian region, which it has done primarily through sales to the government sector. "In many countries in the region probably the only consistent buyers have been the government agencies," said LaLonde. This is the case in Korea, for example, and in China, where the government is in control of the big infrastructure dollars, he said. In contrast, in other regional markets, such as the US, the commercial sector buys first and then products are accepted by government.

The final factor in developing the local industry will be government policy. Numerous multinational firms have criticised the existing investment infrastructure and incentive programs, and the Howard Government has attempted to meet some of those criticisms with a range of reports on industry development and the establishment of the National Office for the Information Economy. With an election in the second half of the year now all but confirmed, however, IT policy is likely to take a back seat in the near future.

**Angus Kidman and Selina Mitchell**





# A giant step for mankind.

## A small footprint for your desktop.



This new PanaFlat LC40 is a MultiScan colour TFT LCD Monitor, and it's part of Panasonic's new range of computer monitors. It's a range which gives you a choice between this LCD and CRT monitors in four screen sizes: 15", 17", 19" and 21". The new SL range of 17" and 19" CRT monitors are 20% shallower than any other CRT monitor, so their footprint is far, far smaller. And because the PanaFlat LC40 has a depth of only 149mm, its tiny footprint gives you a much bigger desk.

The PanaFlat LC40 is state-of-the-art, it has full screen display at all resolutions, it's plug-in compatible with CRT monitors.

For more information please contact Customer Care on 132 600.

What's New  
by  
**Panasonic**

Swift & Ulin PA NT



*Startup begins the long march to tackle Cisco.*

# Juniper steps into the light



In July 1, a company you've probably never heard of made an announcement you probably didn't notice. But some of Silicon Valley's shrewdest minds are betting that tiny Juniper Networks is on to something big enough to shake up the lucrative Internet infrastructure market. It's a gamble, for sure — but with hundreds of billions of dollars at stake, it's worth a punt.

Currently, the Internet hardware market is ruled by Cisco, which has an iron grip on routers comparable to Microsoft's software dominance and Intel's processor stranglehold. An entrenched position as the Net's de facto routing standard, \$US8 billion in revenues and an aggressive acquisitions strategy make Cisco a formidable competitor. And the company was quick to jump on IP as the convergence point between data and voice networking, striding aggressively into the traditional preserve of companies like Lucent, Nortel, Siemens and Ericsson. Lucent hit back through patent attorneys, while in June Nortel lay down \$US9.1 billion to acquire traditional Cisco rival Bay Networks.

That's the big picture. Juniper represents quite a different threat to Cisco's hegemony. A 90-person startup in the high-tech heartland, Juniper is developing a new class of IP internetworking device that could make traditional routers obsolete. Its answer to the world's crying need for Net bandwidth depends upon successfully combining the best of computing and telecommunications.

Juniper hopes to explosively increase network capacity by hitching Moore's Law to the only hardware science with a performance trajectory that outstrips computer chips: fibre optics. In effect, the startup wants to multiply Moore's Law by Payne's Law, the observation that optical throughput doubles every 12 months.

The company has not yet announced its hardware plans, but the critical component will be silicon: an ASIC that encapsulates the most efficient IP routing algorithms. Juniper's emphasis on IP is fundamental to its focus on core routing for the Internet. Juniper believes backbone infrastructure should be delineated from 'edge' functions like corporate Net links and ISP dial-in services. Juniper is singularly focused on the big end of town. The

objective is building a lean, mean, backbone-routing machine with full implementation of essential protocols like Border Gateway Protocol (BGP), the Net's core routing standard.

The July announcement provided the first look at Juniper's software design. The Junos platform offers "a ground-up perspective on Internet software" designed with Internet management and scaling issues in



mind, according to Juniper marketing director Joe Furgerson. Router software is often stripped down to bare essentials, but Junos implements modern NOS features like protected memory, modular design and an exclusive IP specialisation. The objective is greater reliability, smoother upgrades, sharper focus and performance boosts.

Compatibility with existing vendors is absolutely critical, because network providers are too busy coping with explosive growth to reinvent their networks. For the past six months Junos has undergone extensive testing with major US access providers (Telstra has evaluated the technology, although initial trials were US-only). Multivendor interoperability testing is under way and the particular emphasis is Cisco compatibility — even to the extent of supporting flaws in the router king's TCP implementation.

Still, an improved router OS alone will not solve Internet backbone congestion or reduce routing complexity. Juniper is also chasing the elusive holy grail of core routing: quality of service (QoS).

QoS is the largest hurdle the Net must surmount before it can compete against the quality metrics of established telco-grade products. A QoS breakthrough will expand the Net beyond its current base (which is limited to services like email and Web browsing, where 'best-effort' is good enough) to reach into lucrative voice and video markets and mission-critical enterprise applications like virtual private networking and distributed client/server.

Conventional wisdom holds that QoS is near-impossible across current IP networks

(see <http://www.apcmag.com/features/inet2000.htm>). Traditional routing offers an easy topology, but data flows inside the network core are largely invisible and hence unmanageable. Congestion effects can be unpredictable to the point of failure.

Companies requiring traffic control generally steer towards ATM (asynchronous transfer mode). Initially deployed for its throughput advantages, ATM virtual circuits offer the bonus of traffic transparency. Furgerson argues this helped big ATM backers like MCI and UUNet manage traffic growth more effectively than ISPs which stuck with routed cores. But escalating cell tax overheads and scalability shortcomings are putting a ceiling on ATM's appeal.

Juniper believes it can challenge traditional perceptions about QoS on IP. "People from the ATM camp have often said quality of service is difficult or impossible to do on IP," Juniper founder Pradeep Sindhu told APC. "I think it is possible and very straightforward," he said, although refusing to detail the startup's plans. "IP can carry delay-sensitive traffic if it's engineered correctly," added Sindhu.

Hints about the company's direction came in the July software statement. It is betting on an emerging Internet standard called Multiprotocol Label Switching (MPLS). An IETF-sponsored approach to proprietary technologies like Cisco's tag-switching and Ascend's IP Navigator, it allows edge devices to label packets so they can be sent directly through a switched network core without incurring routing overhead at every hop. Essentially it maps Layer 3 concepts onto Layer 2 devices.

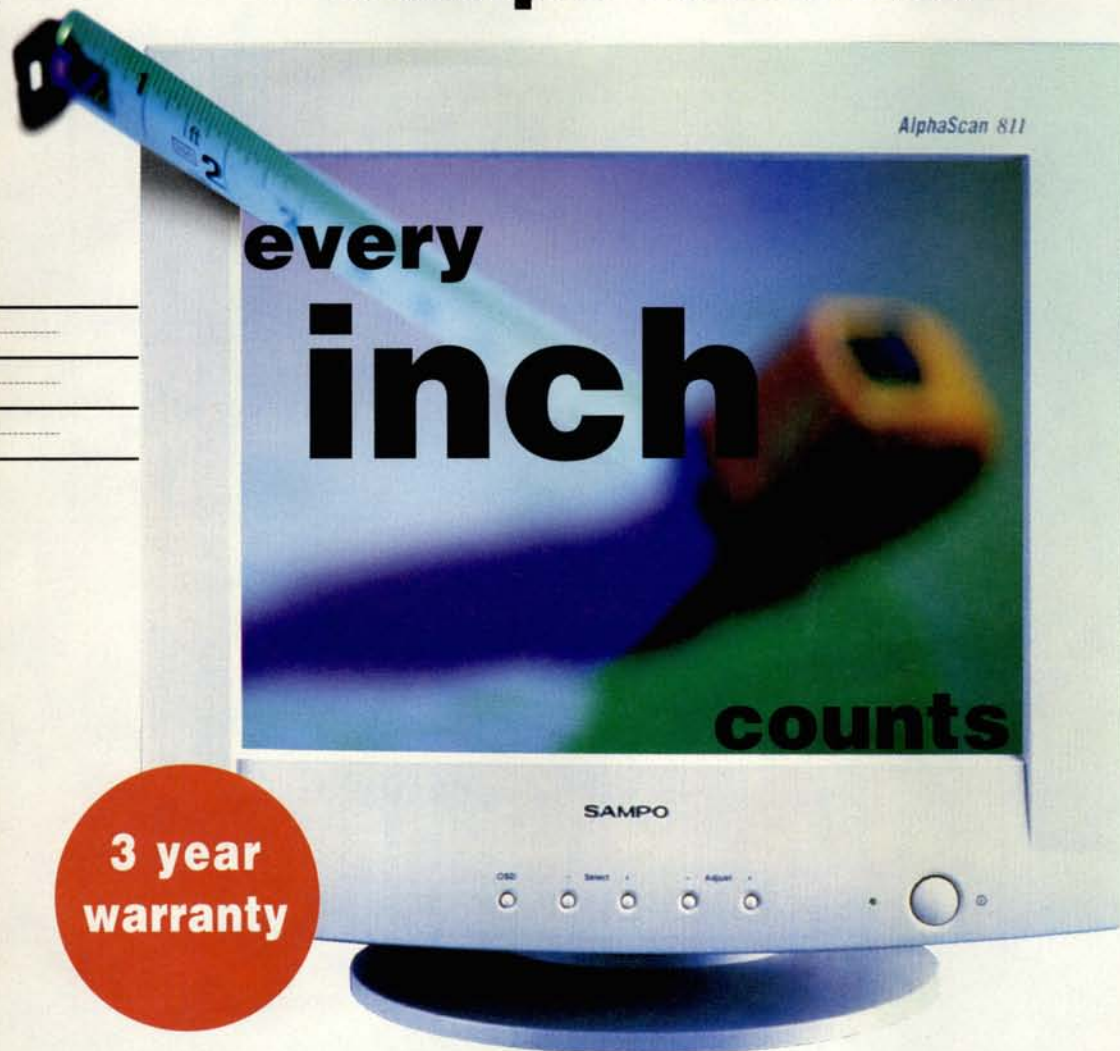
MPLS could be the foundation for QoS in the Internet core. It suits Internet scale requirements better than ATM because devices only need to know a path from A to B, rather than establishing a mesh of redundant PVC connections to every possible router.

Juniper still has much to prove before its claims are realised. But the company's backers (including 3Com, AT&T, Lucent, Ericsson, Nortel, UUNet and IBM) are eager to turn up the heat on Cisco, so expectations will reach fever pitch later this year when hardware completes the puzzle.

**Dan Tebbutt**



# with a Sampo monitor



*With larger diagonal viewable areas, Sampo Monitors give you a fuller image. Open up to a world of colour and clarity and experience the benefits of a Sampo Monitor.*

Specifications	14"	15"	17"	19"	21"	29"(Full Square CRT)	34"(Full Square CRT)
Model Number	KM 411	KM511Z/SDL	KM711	KM811	KM 950	SM-7202	SME-23D3
Screen Size	13"	14"/14"	16"	18"	20"	27"	32"
Dot Pitch	0.28mm	0.28mm/0.28mm	0.28mm	0.26mm	0.28mm/0.25mm	0.74mm	0.80mm
Max. Resolution	1024x768	1024 x 768/1280 x 1024	1280 x 1024	1600 x 1200	1600 x 1200	1024 x 768	1024 x 768
Horizontal Frequency	30-54 Khz	30-58 Khz/30-70 Khz	30-70 Khz	30-95 Khz	30-95 Khz	31-38 Khz	31-48 Khz
Regulatory Compliance	UL, CSA, DHHS, TUV/GS, CE FCC-B, MR-II (Opt.)	UL, CSA, DHHS, TUV/GS, CE FCC-B, MR-II (Opt.)	UL, CSA, DHHS, TUV/GS, CE FCC-B, MR-II (Opt.)	UL, CSA, DHHS, TUV/GS, CE FCC-B	UL, CSA, DHHS, TUV/GS, CE FCC-B, EN-61000-3-2 Class-D (Opt.)	UL, CSA, DHHS, TUV/GS, CE	UL, CSA, DHHS, TUV/GS, CE
Warranty	3	3	3	3	3	1	1
Audio						12W +12W NTSC/PAL, S-Video Composite	12W +12W NTSC/PAL, S-Video Composite
Video Signal							



Quality  
Endorsed  
Company  
AS9002 LIC3427  
Standards Australia

**DEALER ENQUIRIES WELCOME**

**To find out more call:**

**(02) 9841 2777**

48A Egerton Street, Sliverwater NSW 2128



**OPTIMA**  
OPD DIVISION



**KM-511  
15" Monitor**

- 1024 x 768 Max Resolution
- 0.28mm Dot Pitch



**KM-711  
17" Monitor**

- 1280 x 1024 Max Resolution
- 0.28mm Dot Pitch



**KM-811  
19" Monitor**

- 1600 x 1200 Max Resolution
- 0.26mm Dot Pitch



**PD-50F**

- High Resolution - 1024 x 768
- Distortion Free Image
- Vivid High Brightness

**SAMPO**

www.sampo.com.tw  
www.sampotech.com



# AERO Dynamic



## Sunrise ATX/ AT Series

- Aero dynamic shape & finish
- Cooling ventilation w/ dust filter
- Easy rear outward M/ B tray
- Extra one cooling fan installed
- Anti theft security lock



KA- K10

KA- S10

KA- 510

KA- 610

## 19" Industrial Rack Mount Case

- Suitable for ATX/ AT from factor
- Extra large cooling fan through dust filter
- Optionally for dual hot swappable P/ S



KI- R30

KI- P20

## Super NT Files Server Case

- Easy to join/ split up both systems and storage devices cases in one/ two
- Optionally fitted in with dual hot swappable P/ S internal UPS
- Hot swappable RAID mobile racks
- Convertible to 19" rack mount cases

## Storage Case

- For SCSI/ fast wide SCSI 68 pins
- Available from 1/ 2/ 4/ 8/ 14 bays
- Hot swappable RAID system mobile rack ( MR- 10 ) w/ fan alarm
- Aluminum alloy structure for excellent heat dissipation
- Cooling fan through dust filter



SC- 504

SC- 502

NT- A18

MR- 10 W/ S/ 1



Headquarters

**MACASE INDUSTRIAL CORP.**

Internet URL: <http://www.macase.com.tw>  
Email: [sales@macase.com.tw](mailto:sales@macase.com.tw)

3F., No. 70, Sec. 1, Kwang- Fu Rd., San Chung Taipei Hsien, Taiwan TEL: 886- 2- 29954277 FAX: 886- 2-29954296

Australia / Sydney

Unit 3, 100- 108 Asquith Street, Silverwater 2128, N.S.W. Australia TEL: 61- 2- 97480001 FAX: 61- 2- 97480095



## Intel Pentium II Xeon

**I**ntel launches new processors at such a dizzying rate these days that it is becoming difficult to keep up. June 30 marked yet another processor launch for Intel: the Pentium II Xeon, which rounds out Intel's range by providing a processor for workstation and server systems. The cost of the processor reflects its target market: Intel charges a large premium for the processor, particularly for Xeons with larger caches.

Intel is persisting with its 'P6 core in everything' strategy and differentiating its products through the L2 cache. The performance improvement provided by the Xeon comes primarily as a result of the increased clock speed of the cache, which now runs at the full clock speed of the processor, as opposed to the half-speed cache in the Pentium II. In some models (although not the one with which we were provided) Intel is doubling and perhaps quadrupling the size of the cache to 1M or even 2M in models to appear later this year. The Xeon also incorporates Intel's System Management Bus, which streamlines communications between the processor, thermal sensors and other system components.

The Xeon is also the first Slot 2 processor; its cartridge package is significantly larger than that of the Pentium II and requires a larger slot with a greater number of pins than the Pentium II.

The performance of the Xeon machine is difficult to evaluate. The processor itself does not provide any more raw MIPS than a Pentium II processor, but the improved cache architecture means that applications generating a lot of cache hits will sometimes have dramatically improved performance. Performance may even vary significantly across a range of products of the same type, depending on the architecture of the software. As a result, there are as yet few general-purpose benchmarks that make use of the improved L2 cache architecture in the Xeon.

Unfortunately, without benchmarking each individual product, it's impossible to tell whether it's worth using a Xeon in lieu of a good old Pentium II processor, and we recommend that you benchmark a Xeon system with the desired applications before committing your organisation to buying one (they are rather expensive purchases, after all).

Intel claims to have the lead in the field, at least when it comes to transaction processing. The company cited performance results using SAP, the Transaction Processing Council's TPC-C and SPECweb96 from the Standard Performance Evaluation Corporation which show the Xeon is a real player.

If you expect to find your favourite game or even workstation application dramatically speeded up, however, you may be rather disappointed. Running Ziff-Davis' Winstone 98 1.0 on a 400MHz Xeon machine submitted to us by Beyond Computers showed the system did have a small performance gain over the 400MHz Pentium II PCs we looked at a few months ago (see APC July, page 107). This was no doubt aided by the impressive specifications of the Beyond system (see sidebar).

In spite of its less than clear performance advantages, Xeon is destined to be successful, if only for the fact that it finally gives x86 server and workstation vendors an escape from using the two-year-old



Pentium Pro processor for machines with greater than two-way SMP.

At its launch, Intel announced two new chipsets for use with the Xeon processor — one for server systems and one for workstations. The workstation AGPset, the 440GX, supports dual Xeon or Pentium II processors, AGP, up to 2M of SDRAM and the 100MHz front-side bus.

The more significant release is the server chipset, the 450NX. A PCIset only (it doesn't support AGP), the 450NX has many features that server vendors have been asking for. Designed for the Pentium II Xeon processor, the NX chipset supports up to four-way multiprocessing natively, can address up to 8G of memory and includes an enhanced I/O architecture.

It also includes support for multiple PCI buses, including 64-bit PCI buses for devices such as RAID and Gigabit Ethernet controllers, which require high bandwidth. The chipset also offers support for third-party controllers for greater than four-way multiprocessing. As a result, several of the major server vendors should be releasing six and eight-processor machines in no time.

**Nathan Taylor**

### Beyond Xeon UltraServer 400

Distributor	Beyond Computers
Phone	(02) 9417 3688
Price	\$6,918
Online	<a href="http://www.beyondcomputers.com.au">http://www.beyondcomputers.com.au</a>
Processor	Intel Xeon 400MHz
L2 cache	512K
RAM/type	128M SDRAM
Controller chipset	440GX
Hard disk drive	4.5G Seagate ST34573LW
Hard disk controller	Adaptec AIC-7895 SCSI
Video adapter	4M Diamond Viper V330 AGP
Video RAM type	SGRAM
CD-ROM drive speed	32x max
CD-ROM drive model	LG CRD-8320B
Network adapter	SMC Fast Ethernet
Monitor	15in V500
Warranty	2 years parts, 5 years labour

### Intel Pentium II Xeon

■ Distributor	Intel
■ Phone	(02) 9937 5800
■ Online	<a href="http://www.intel.com.au">http://www.intel.com.au</a>
■ Price	In 1,000-unit quantities: 400MHz with 512K L2 cache \$US1,124; 400MHz with 1M L2 cache \$US2,836.
■ In short	Best to benchmark it with your specific applications before buying.



*A handy update for Windows developers.*

# Microsoft Visual Studio 6.0

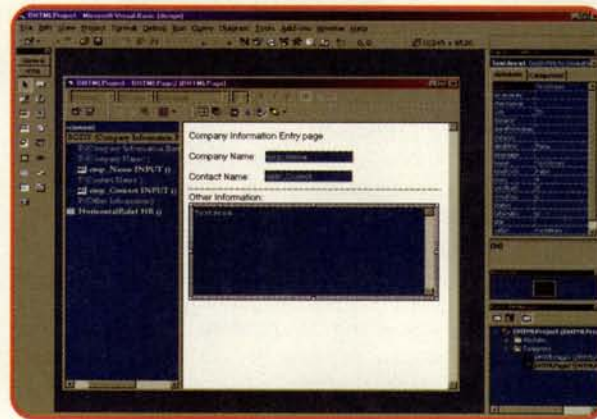
**M**uch has been said about Microsoft's marketing ability, but there is much more to Microsoft than slick advertising. Perhaps more impressive is the company's strategic planning and cohesion, evidenced in the forthcoming release of Visual Studio 6.0 (likely to be called Visual Studio 98 on release). It's no secret that applications make or break an operating system, and it should come as no surprise that Microsoft has spent a great deal of effort to make the process of creating applications for Windows easier.

As a toolset, one of the most notable aspects of Visual Studio 6.0 is its reliance upon proprietary Microsoft technologies. For example, many of the tools are geared towards the current trend of Internet and intranet development, using the browser as a front end to back-end business logic. However, most of these features will only work with specific combinations of Microsoft Windows NT, Microsoft Transaction Server, Microsoft IIS and Microsoft Internet Explorer 4. Developers looking to create applications for heterogeneous computing environments should seriously consider using more standards-based tools. However, for shops that have standardised on Microsoft's products, the final version of Visual Studio 6.0 should prove to be a compelling upgrade.

While previous versions of the Developer Studio seemed to be something of a collection of disparate development tools, Visual Studio 6.0 aims to provide a complete development solution, from design to deployment. To achieve this end, Visual Studio 6.0 bundles together Visual Basic, Visual C++, Visual InterDev, Visual J++ and Visual FoxPro. Each of these products has seen a great deal of individual improvement, but more importantly, the entire product family has been engineered to offer better interoperability between tools. One area that Microsoft still needs to address, however, is the lack of consistency across user interfaces in the suite.

Microsoft has improved Visual Studio's team-based development management and coordination. To assist in object tracking and code reuse, Visual Studio 6.0 will ship with the Visual Component Manager (VCM). The VCM is a central component

manager for the suite, and can store anything from COM objects to active server pages. Each of the individual tools in the suite is integrated with both the VCM and Microsoft's Repository, and publishing and retrieving objects is easy work.



Other additions to the suite include Visual Modeler 2.0 and Visual Studio Analyzer. The latter allows developers to take a COM-based view of an application. It also acts as a performance profiler, allowing developers to easily track down application performance bottlenecks. Visual Modeler 2.0 (previously available only as an add-on) is a modelling tool for developing multi-tiered applications, and can produce source code in either Visual Basic or C++.

Also integrated into the suite is Microsoft's Database Designer, a visual database design tool. Of note is Database Designer's newly added support for Oracle 7.3 (and higher) databases. Previously, Database Designer only supported Microsoft's SQL server. Also included are a number of Visual Database tools, aimed at simplifying the process of creating SQL queries and ODBC database views.

All Visual Studio 6.0 components now support ActiveX Data Objects (ADOs) and OLE DB connectivity — a major step forward for the suite. ADO is a COM-based data access abstraction layer, and provides consistent methods across the Visual Studio tools for accessing relational and non-relational data.

Another noteworthy addition to all of the tools in the suite is Microsoft's Intelli-

Sense. IntelliSense is a background process that checks for syntax errors in programming code, similar to the spell checker in Microsoft Word. IntelliSense can also intelligently display class information, such as properties and methods, and auto-complete programming statements.

## Visual C++ 6.0

Of all the applications in the suite, Visual C++ has seen the fewest number of improvements, but the ones that have been made are substantial. Typically, C and C++ are used in performance-critical application components, and it is here that Visual C++ 6.0 excels. Microsoft claims that code compiled with

Visual C++ 6.0's compiler runs up to 20% faster.

Other performance-related enhancements include the ability to specify whether dynamically linked libraries are loaded when an application loads, or delayed until the library is needed. Developers can now postpone loading of infrequently used libraries until they are required by the application, taking a small performance hit for quicker application load times.

Visual C++ includes an 'Edit and Continue' feature borrowed from SuperC's Java and C++ compilers to improve the development and debugging cycle. During a debugging session, data values and code logic can be manipulated, and the changes are seamlessly recompiled, and execution continues to the next breakpoint, eliminating the need for a full recompilation.

Like the rest of the Visual Studio apps, Visual C++ now offers better support for Internet/intranet applications. As would be expected, it is possible to use Visual C++ to create COM objects, possibly to be deployed in Internet Explorer. Visual C++ goes one step further, however, and offers support for creating application front ends using dynamic HTML, thanks to added Internet support in the Microsoft Foundation Classes (MFCs).





Daewoo monitors  
give you  
more breathing space  
when you're in a  
tight corner

Daewoo's leading edge short-neck tube technology means Daewoo's new monitors have a smaller rear end. So you get a lot more free desk space. Daewoo's monitors also feature; up to 10% larger viewing area than the rest, Low glare, Digital onscreen display, "Trueview" low distortion for clearer graphics, and Windows 98 compatible "Plug 'n Play" (hook it up and the computer sets it up) and of course Daewoo's unique Three Year Pick Up and Deliver Warranty.

Isn't it time you discovered the Daewoo difference? For more information call 1800 809 397.

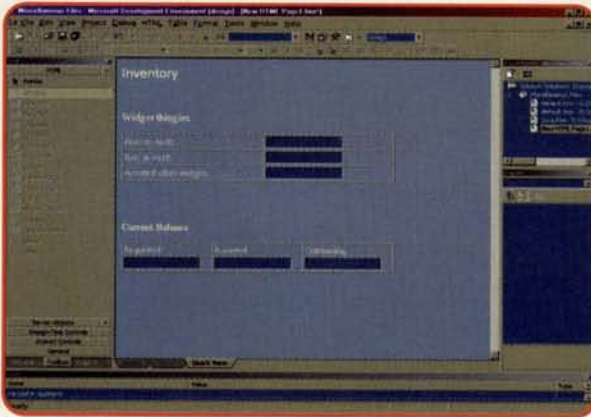


**DAEWOO**  
ELECTRONICS



## Visual Basic 6.0

The majority of improvements to Visual Basic (VB) are geared towards Microsoft's vision of the Internet. The most notable inclusion with VB is Microsoft's WebClass



Designer. WebClasses assist developers looking to create server-side COM objects, a weak area in earlier versions of VB. To take advantage of this feature, the server must include support for Active Server Pages.

Also receiving attention is the process of creating Web-based applications. VB 6.0 includes a new dynamic HTML Page Designer, which can be used to visually create dynamic HTML pages, moving the smarts from the server to the browser application. Once again, to take advantage of this technology, the end user must be using IE4 or 5.

Finally, VB has seen great improvements in database connectivity. As mentioned earlier in this article, VB 6.0 now supports Microsoft's ADO and OLE DB technologies, features lacking in previous editions.

## Visual J++ 6.0

'It's Java, Jim, but not as we know it.'

Java's strength (cross-platform capability) and its weakness (slow execution time) have generally dictated its use — cross-platform front ends to back-end data. However, Microsoft is determined to change all that. By introducing the Windows Foundation Classes (WFCs), Microsoft has improved application speed at the cost of its cross-platform capabilities — exactly what Java developers feared might happen.

In addition to the WFCs, Microsoft has added support for its proprietary JDirect method calling procedure. JDirect lets Java programs call Windows API func-

tions natively. Unfortunately, using JDirect calls requires the use of pointers, yet another Microsoft 'enhancement' to the language.

Visual J++ does not provide support for the JavaBeans component model. JavaBeans can, however, be used if they are wrapped in an ActiveX container, and the most recent version of Visual J++ now supports the creation of ActiveX controls.

One major improvement that Microsoft has made to Visual J++ is the move to a visual development environment. Forms can now be created in the usual drag-and-drop manner, and the IDE (Integrated Development Environment) now supports two-way communication between source code and visual components. However, visual design is only available with the WFCs, and cross-platform applications must still be coded by hand.

## Visual InterDev 6.0

Visual InterDev is an important component of Visual Studio. Visual InterDev is a one-stop solution to creating and maintaining Internet/intranet-based applications. The array of tools include support for creating HTML, dynamic HTML, Cascading Style Sheets and Active Server Pages, and linking those to back-end databases.

The IDE is the most immediately noticeable area to receive improvement. Now resembling a cross between Visual J++ and Visual Basic, the IDE features the ability to name tool layouts. This feature lets developers switch between layouts for building and debugging different site areas.

Another nice feature is the built-in preview view, which lets the developer make design changes and instantly preview the changes in a Web browser. At this time, previews are only available for IE4, although other browsers can also be targeted on deployment.

Debugging support for the various server and client-side code is also well implemented. Breakpoints can be set, and execution can be traced through ActiveX controls, Java, JavaScript and dynamic HTML, and across both client and server-side components. As with the other Visual Studio applications, Visual InterDev includes Microsoft's IntelliSense syntax

highlighting for HTML, DHTML and script creation.

## Visual FoxPro 6.0

Visual FoxPro 6.0 features many of the same enhancements available in the other components of Visual Studio plus a few additional compelling enhancements that bring the legacy Xbase technology in step with the current development climate.

The most notable enhancement is automated year 2000 compliance. When a date is entered into Visual FoxPro, it is checked against Visual FoxPro's 'strict date' format, and potentially problematic dates can be flagged and updated. This feature alone justifies the cost of upgrading, as it greatly simplifies the process of becoming Y2K compliant.

Visual FoxPro 6.0 has also been improved to simplify the process of creating multi-tiered applications. A number of new wizards have been included which create skeleton code based on application parameters. For transaction management, Visual FoxPro 6.0 now integrates better with Microsoft's Transaction Server (MTS).

Also new to FoxPro 6.0 is a collection of class libraries that simplify the process of creating FoxPro applications. The inclusion of the Component Gallery helps to organise the various components, and decreases the productivity gap that existed between Visual FoxPro and competitors such as Oracle and Sybase.

If you use earlier editions of Microsoft's development tools, Visual Studio 6.0 should prove to be a valuable upgrade, and almost mandatory for Microsoft-only developers. If, however, you've ever been frustrated wrestling with Microsoft's notion of standards, you might be better off utilising tools from other manufacturers.

Travis Simon

### Microsoft Visual Studio 6.0

■ Distributor	Microsoft
■ Phone	132 058
■ Online	<a href="http://www.microsoft.com.au">http://www.microsoft.com.au</a>
■ Price	Professional \$1,609; Enterprise \$2,409
■ In short	Visual Studio 6.0 is an excellent development suite, but relies very heavily on proprietary Microsoft technology.



# **SUPER-FAST 56K** **at no extra charge!**

## **Are you paying too much for your Internet access?**

Combining world-leading Ascend high speed switching products with proven Rockwell K56flex technology, Netspace now offers 56Kbps modem Internet access and download speeds - **at no extra charge.**

With super-fast K56flex access points in Melbourne, Sydney, Brisbane, Adelaide, Perth, Hobart, Launceston and Victorian provincial centres at Geelong, Sale, Cranbourne and Traralgon, all Netspace accounts include full access to WWW, e-mail, News, IRC, UNIX and you can also publish your own home page on our server. Plus....

- *Quarterly or yearly subscriptions*
- *20/40/60 hour monthly Internet plans available*
- *'All you need' Internet Starter Kit*
- *7-day telephone support service*
- *No download limits - even at 56K!*

Call Netspace now for pricing and information on our economical Business, Educational and Home User accounts, plus the special 'all you need' Internet Starter Kit. It could save you a lot of waiting and a lot of money.

# **Netspace**

plug.yourself.in



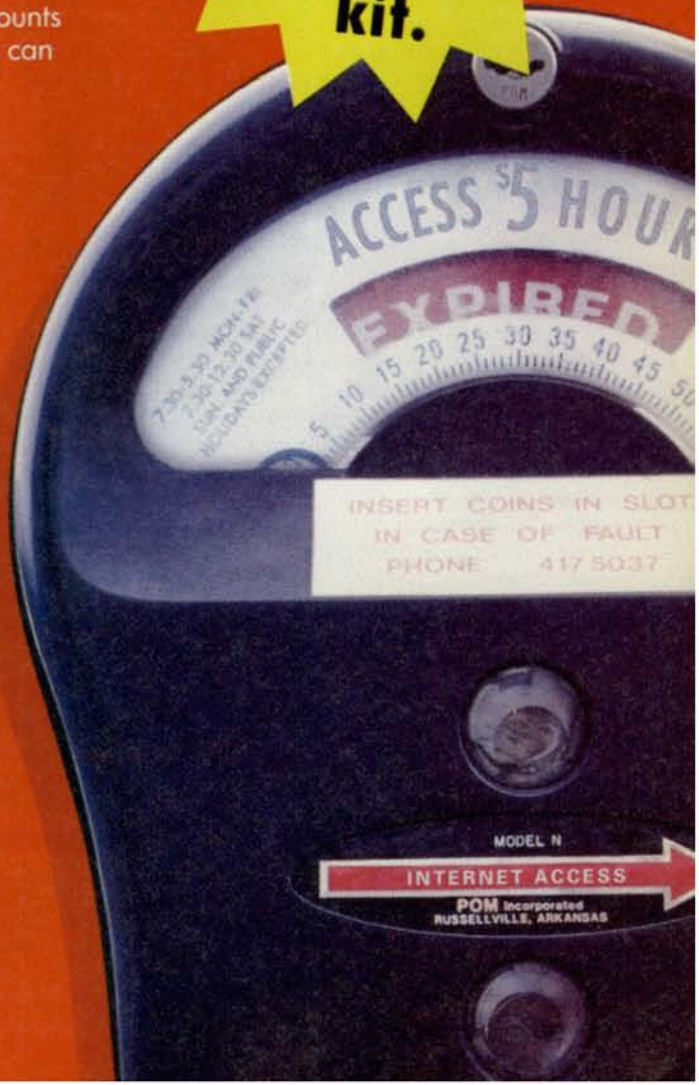
## **1300 360 025**



<http://www.netspace.net.au>  
e-mail: [info@netspace.net.au](mailto:info@netspace.net.au)



**Ring for  
our low-cost,  
high-speed,  
56K modem  
kit.**





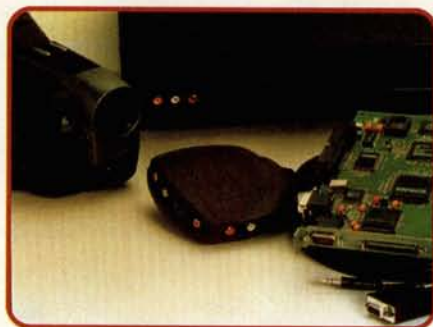
## Iomega Buz

**T**he recognisable part of the Buz package is a purple box, made from the same hard plastic as Iomega's Zip and Jaz drives. But this is really just a gimmick — the heart and soul of Buz is a PCI video capture card that doubles as an Ultra SCSI adapter, so you can connect a Jaz (or Zip SCSI) drive to the same card as your video sources.

The box is primarily a place for Iomega to fit the input and output jacks, as the SCSI port hogs the card's backplate, leaving room for only a 15-pin connector that leads to the Buz box. On the box are stereo audio jacks as well as composite and S-Video jacks, for input along one side and output on another.

At \$429, Buz is not a high-end product, but it's adequate for those producing video for presentations, home use or Internet transmission, such as RealVideo. It uses MJPEG video with resolutions of up to 768 by 576 at 25 frames per second (fps) under PAL; 30fps is possible in NTSC format. The maximum sustained data rate is 6Mbps.

The documentation and set-up instructions are thorough and easy to understand



(in print and on the packaged CDs), while the included software is quite functional, though difficult to learn. The main inclusion is MGI VideoWave SE Plus, a very graphical application that lets you capture video in a window, arrange transitions (cuts, fades, and so on), mix in audio, add text and combine everything into a final work.

You'll want a fairly new PC to get the most out of Buz, as there are compatibility problems with several older video cards and some brand-name PC lines.

In testing, using a 300MHz Pentium II system with 32M of RAM, a 4M STM Mpack

2 3D video adapter and an Ensoniq Audio PCI card, we produced a couple of short clips by using both an external video source and some included AVI files. The results produced using the lowest quality settings were not pretty, and only medium-quality output was good enough to use. However, attempts at high-quality production were disastrous unless kept very simple — sounds fell badly out of synch and lost quality, and sometimes the video output flickered badly when we attempted to write the finished product to a tape. Watch for updated drivers at <http://www.iomega.com/support>.

**Simon Vandore**

### Iomega Buz

■ <b>Distributor</b>	Iomega
■ <b>Phone</b>	(02) 9416 0434
■ <b>Online</b>	<a href="http://www.iomega.com">http://www.iomega.com</a>
■ <b>Price</b>	\$429
■ <b>In short</b>	A cost-effective option for medium-quality video production, especially if you store the files on a Jaz drive.

## Norton Mobile Essentials

**A**nyone who has been on a business trip with a temperamental laptop computer would appreciate all the help they can get to ensure it never happens again. Norton Mobile Essentials attempts to ease the frustrations of on-the-road trouble for Windows 95 users by providing software to make preparations to avoid it in the first place, provide specific location settings when you arrive to ease the process, and to troubleshoot any communications problems that may arise.

Its three major components are Before You Go, the Location Controller and the Connection Doctor. Before You Go consolidates pre-travel tasks in an easy-to-use, methodical Windows format. The System Check option uses a series of diagnostic programs and utilities to scan your system for problems. The modem and hard drive tests and virus scan can be modified and extra tools can be added.

SpeedSave allows you to back up and collect all the files you need. These can be compressed and stored in a chosen location, such as on a Zip disk, hard disk or your network drive.

The Destination option helps you figure out just what electrical and phone adapters you need for a particular country; the list for many countries offers so many options you may still be confused after the advice! It links to the TeleAdapt Web site to order what you need. There is a North Sydney office for this organisation, but you can also often get the required adapters at the airport or another outlet around town without a problem.

The final feature of Before You Go is Checklist, which supplies you with a set of lists that can be modified and updated and often link straight to Web sites when online. The Traveler's Checklist shows items you will need to take on your trip. It could be useful, depending on how organised you are or want to be. Other checklists include a series of phone numbers for AOL and CompuServe, car rentals, hotels, traveller's Web sites and even a list of numbers to call if you lose your credit card.

The Location Controller automatically adjusts your computer settings (such as dialling sequences and printer setup) when you change locations. You can save used locations for future use, if you plan to

return. Times can be adjusted and other installed programs that require location settings can also be changed.

The Connection Doctor facility allows you to troubleshoot problems. The diagnostics tests will check the computer system, modem and phone line being used. Step-by-step solutions are supplied for detected problems. When your system is running smoothly you can also set up a benchmark against which to gauge future problems.

If you still can't fix a problem, Symantec has partnered with Digital to offer 24-hour worldwide support.

**Selina Mitchell**

### Norton Mobile Essentials

■ <b>Distributor</b>	Symantec
■ <b>Phone</b>	(02) 9850 1005
■ <b>Online</b>	<a href="http://www.symantec.com.au">http://www.symantec.com.au</a>
■ <b>Price</b>	\$139
■ <b>In short</b>	Anything that even attempts to make business travel easier has to be worth considering.





The bible of the printer industry described the BJC-7000 as

# “absolutely breathtaking.”

Hard Copy Observer is arguably the most authoritative publication in the printer industry. In August 1997 they said this about the BJC™-7000:

- "...The BJC-7000 cartridges offer new capabilities never before seen in a desktop inkjet printer...
- "...including a unique new technology for pre-coating plain paper (P-POP) and support for seven colour printing...
- "...the result is a brighter, sharper image, and also a more durable one..."

We couldn't have said it better ourselves.

**"7-colour process."** Only PhotoRealism™ inks on the BJC-7000 use a 7-colour process with conventional CMY inks, lower density CMY inks, plus black. The result is a unique Canon process. The inks can be layered in up to nine saturation levels per colour, per pixel ... to produce up to 90 times the colour combinations of traditional inks. As a result colours have finer gradations without banding and lines, and even hard to produce light shades are exceptionally free of pixelisation.

**Better plain paper performance.** P-POP™ (Plain

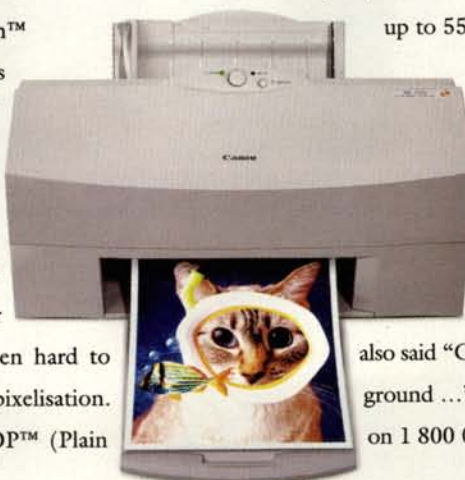
Paper Optimised Printing) bonds an invisible Ink Optimiser to the paper before inks are applied. The inks, in turn, bond to the optimiser. Text and lines are better defined, colours are more vibrant, tones are sharper, and print-outs become virtually water fast.

**And a host of other features.** The BJC-7000 can use both PhotoRealism and optional conventional inks with the black plus ink optimiser cartridge. Both cartridges produce an ink drop literally 1/4 the size of earlier models, plus resolution up to 1200 dpi. Better plain paper use can lower operating costs. It even has the ability to print full-bleed A4 full card stock at paper-weights up to 550 gsm (0.8MM).



**Canon Customer Care.** There is a one-year warranty, upgradeable to three years for minimal cost, and it is backed by Customer Care hot-line support. Drivers are available for DOS, Windows® 3.1x/95 and Windows NT.

No wonder Hard Copy Observer also said "Canon (has) seized the technological high ground ..." If you would like to learn more, call us on 1 800 021 167.



**BJC-7000 colour Bubble Jet™ printer – \$729<sup>RRP</sup>**

# Canon





### The Gadget File

● Not content with offering the mobile executive the power to connect to the Web through a notebook, phone maker Ericsson has gone one better and devised a method to help banish flat battery woes caused by power-hungry PC Card modems. Following the launch of its clip-on IrDA modem (the DI27), it has moved the smarts inside the phone case, put the window on the body of the phone itself and used the internal phone battery to power it. So the user only has to lie the phone (provisionally called the 888) down next to a notebook's infra-red window, then dial up, exchange data and log off with never a cable, modem card, configuration obstacle course or even clip-on modem in sight. The big advantage is obviously battery life, but the system also cuts down considerably on cables and connectors. Apparently Nokia is also busy ramping up for a similar IrDA-equipped phone release later this year.

● Credit card-sized smart cards are becoming very popular for security and basic data-carrying purposes, but the main problem is their unidirectional data exchange. Most card readers can suck information off, but writing or updating information is usually a bit more complex (not to say expensive) using either magnetic or RAM-based storage technologies. Canon has come up with a new solution that substitutes optical rather than traditional electronic data exchange for all but the basic card ID details. The RW-50 system uses optical WORM (write once, read many) technology, much like standard CD writers do, but in linear patterns, not circular. A tiny laser etches coded data onto a specially prepared section of the card, which can then be read by any suitable optical reader. The card can carry a maximum of 6M of optical information, but can also support standard photographic, SIM contact and magnetic stripe information as well. Another advantage is that the data is very durable, unlike magnetic stripe or RAM-based data. Lastly, it is much more

resistant to cloning than magnetic or electronic data and can easily store images (such as fingerprints) for high-security pass-card purposes. Canon claims the combination of optical and electronic storage on one card for about \$6 per card will offer a whole range of possibilities for both biometric security and cash-based cards.

● Also on the card front, but this time in a much smaller format, is the new Multi-MediaCard launched by SanDisk, the company behind the CompactFlash memory card format. This is already used by many Windows CE machines and digital cameras. According to initial reports, the card will be very similar to the SIM cards used in current GSM phones — that is, tiny and very thin — but will be capable of storing an impressive 10M of data in a variety of formats. First usage will be in Communicator-style organiser/phone products, but SanDisk is hoping the format will see acceptance in a variety of pocket and handheld data processing and storage devices.

Jeremy Torr

## Xircom RealPort

**D**ongles are to a large extent the bane of the existence of PC Cards. For most of them you need proprietary cables to connect them to your phone line or Ethernet network. Lose the cable, and you're screwed until the manufacturer gets around to giving you a replacement, often at considerable cost.

A sensible solution to this problem comes in the form of the Xircom RealPort, a combo PC Card with connectors — and even LEDs — built right into the card. Your phone line and twisted-pair network cables plug straight into the card, rather than requiring a special cable. As you'd expect, this makes the RealPort somewhat thicker than most Type II PC Cards, and it actually takes up two PC Card slots (in other words, it's a Type III PC Card). Given that it takes care of both modem and network functions, this shouldn't be a problem for most users, unless you need some other kind of PC Card, such as a multimedia or SCSI card.

The Ethernet adapter operates at full Fast Ethernet rates (10/100Mbps), while the modem portion of the card is a 56Kbps modem of the K56Flex (Rockwell) variety; a flash upgrade to V.90 should be avail-



able by the time you read this. Amazingly, the card even has a telephone pass-through and a special connector for mobile phones (currently only a limited range of Ericsson, Siemens and Nokia phones).

The product has been approved in a large number of countries, including Australia, and the supplied software allows the settings to be switched to comply with the regulations of the country from which you are dialling. Xircom officials also claim the modem is electrically shielded against high-voltage digital lines.

Because of its Fast Ethernet function, the RealPort requires a CardBus-compliant PC Card slot. Apart from that, the device is easy to install and completely compatible with the drivers of earlier Xircom combo cards.

The card installed like a dream onto our notebook, which was running Windows 98, coming up with the CountrySelect Utility and configuring the modem and Ethernet connections automatically. Testing with both a dial-up network connection and connection to our 10BaseT network proved that the card was ready to deal with both environments.

While it is a very good product, \$729 (the suggested retail price) is a bit steep, even for a combo card. When comparable cards, albeit with dongles, sell for more than \$200 less it would be hard for many to justify an upgrade to the RealPort. Nonetheless, Xircom has gone all out on this one to make it the best card of its type, and has probably succeeded.

Nathan Taylor

### Xircom RealPort

■ Distributor	Xircom Australia
■ Phone	(02) 9911 7790
■ Online	<a href="http://www.xircom.com">http://www.xircom.com</a>
■ Price	\$729
■ In short	A great card and a great idea, if a little steep in price.



It is no mean feat to make Australia's most popular printer for home and small offices better than ever. But that's just what we've done with the new BJC™-255SP.

**Use 75% less ink.** Super Economy mode reduces ink consumption by 75% compared to Standard mode, and works for both black and white and colour. Combined with a high capacity, black ink cartridge, it can print up to 2400 pages in black and white, and up to 600 in colour using standard inks\*. That's anywhere from two to five times the output of any direct competitor!

**Fast B&W plus photo quality printing.** Then, there is a choice of high-speed B&W, or three colour print modes – Normal, Fine and Photo. Photo mode emphasises highlights and contrasts, and improves half-tones by producing a richer process black.



Brilliant colour, super economy, optional PhotoRealism, improved Internet printing,

# all for just \$199.

**Optional PhotoRealism™** To this Canon adds the option of PhotoRealism inks, for photographic reproduction approaching silver halide quality. By layering inks in up to four densities, it produces up to four times the colour combinations of conventional CMY printers, for smoother colour gradations and more accurate colours in skin tones and other light shades.

**Better Internet images.** Image Optimisation takes low resolution Internet images (typically 72 dpi), and prints them at the highest resolution supported by the printer to reduce jagged edges and pixelisation.

**Canon Customer Care.** All Canon printers feature a one-year warranty, upgradeable to three years for minimal cost, and are backed by Customer Care hot-line support. Drivers are available for Windows® 3.1x/95 and Windows NT.



For all this, there's one thing we haven't changed, the price. It's still a low, low \$199 RRP. For more information call 1 800 021 167.



**BJC-255SP colour Bubble Jet™ printer – \$199<sup>RRP</sup>**

## Canon



# Compaq Presario 1650

**T**op-end notebooks from the major brands have traditionally cost about the price of a new small car. So when Compaq announced it would be selling its top-of-the-line Presario 1650 for just \$5,499, our interest was piqued.

What's more, the 1650 has much more to recommend it than just the price. It's running the fastest notebook processor you can get at the moment — an Intel 266MHz Pentium II — and has 48M of SDRAM installed. At 3.3kg, it's not too heavy, has a nice TFT screen (although 12.1in is a little on the smallish size for modern notebooks) and comes with all the mod cons.

The 1650 is packaged with an integrated K56Flex modem, which is upgradable to the V.90 standard. A 4G hard disk and 24x CD-ROM drive are thrown in, and the latter can be in the notebook at the same time as the floppy drive. The usual ports are all there, including a USB port and two Type II PC Card slots.

The design of the notebook is a big improvement on previous Compaq models, and some of the best notebook speakers you're likely to hear are located at the front of the machine. These are visible even when the machine is closed, and are part of one of the very cool features of the Presario notebook — the ability to play CDs even when it's powered down. All the controls for doing this are accessible when the lid is closed.

The keyboard is responsive, although the same cannot be said about the touchpad. Like many touchpads it was painful to use, and didn't support pad-tapping for mouse-clicks — time to start learning those hotkeys.

The performance of the system was good, although not quite up there with the 266MHz Pentium II Dell and Gateway notebooks we looked at in APC June (note: both of these machines were running Windows 95; the Compaq comes pre-installed with Windows 98). In Ziff-Davis' Winstone 98 1.0



tests, the 1650 scored 17.75; the Gateway scored 20.2. However, the Presario's Ziff-Davis graphics benchmark scores — produced by a NeoMagic MagicGraph accelerator with 2M of RAM — were among the best we've seen at 93.8 and 131 respectively in Business and High-End Graphics WinBench. Its Ziff-Davis CD-ROM and disk performance scores were also excellent.

The battery life of the system was a bit of a let-down. The Presario only lasted two hours and 16 minutes before dying in the Ziff-Davis BatteryMark tests. For a machine with a supposedly 'smart' lithium ion battery, this is pretty poor, even given the use of the high-end processor.

But overall the Presario 1650 represents a great buy from a tier-one notebook vendor. It's an excellent choice if your notebook spends most of its time plugged into a wall socket.

**Nathan Taylor**

## Compaq Presario 1650

■ Distributor	Compaq
■ Phone	1300 368 369
■ Online	<a href="http://www.compaq.com.au">http://www.compaq.com.au</a>
■ Price	\$5,499
■ In short	A great notebook at a very reasonable price, although let down by relatively poor battery life.

## Benchmark results

Product	Compaq Presario 1650
Distributor	Compaq
Phone	1300 368 369
Online	<a href="http://www.compaq.com.au">http://www.compaq.com.au</a>
Price	\$5,499
Processor	266MHz Pentium II
Secondary cache	512K
RAM	48M SDRAM
Hard disk drive	4G IDE
Hard disk file system	Fat32
Video bus type	PCI
Video RAM	2M
Video controller chip	NeoMagic MagicGraph128XD
Video controller driver installed	4.10.01.0005
Pointer device	Touchpad
Dimensions (cm) (H by W by D)	4.8 by 30.5 by 25
Weight	3.3kg
PC Card slots	2 Type II or 1 Type III
CD-ROM drive	24x Toshiba XM-1702BC
Tested CD-ROM/controller/cache setting	ATAPI/Windows
Sound chip	Compaq Audio
Modem	Integrated K56Flex
Display	12.1in active matrix TFT
Maximum internal resolution	800 by 600
Operating system	Windows 98
Warranty terms	1 year parts and labour, 1 year RTB

Business Winstone 98 (Winstone units)	17.75
CD-ROM WinMark 98 (K per second)	1,420.00
CPUmark32	690.67
Business Disk WinMark 98 (K per second)	876.33
High-End Disk WinMark 98 (K per second)	2,540.00
Business Graphics WinMark 98	93.80
High-End Graphics WinMark 98	131.00
BatteryMark (hours:minutes)	2:16

The product used in these tests is the shipping version available to the public at the time of publication unless otherwise stated.

Winstone, WinBench and associated products are registered trademarks of the Ziff-Davis Publishing Company.

These tests were performed without independent verification by Ziff-Davis Publishing Company.





**Canon BJC-80**  
**\$399<sup>RRP</sup>**



**Canon BJC-50**  
**\$699<sup>RRP</sup>**

Advanced colour, cable-less communications, optional scanner plus two sizes that are

# Small and smaller!

Canon has a wonderfully new idea for people that need a portable printer. A choice.

On the small side there is the BJC™-80. It is a fraction of the size of a briefcase. Yet, with its in-built sheet

## Drop Modulation Technology.

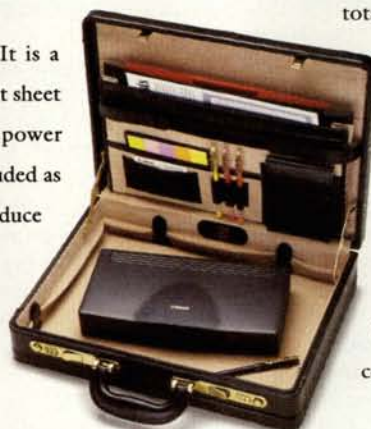
feeder and power adaptor included as

standard, it is designed for people who have to produce high volume output from a very small printer.

Conversely, if size is critical, there is the brand new BJC-50 with in-built battery. It's not just small, at approximately half the size of the BJC-80 it's absolutely tiny.

Equally impressive, their performance is as big as their size is small.

Using Canon's advanced Drop Modulation Technology™ you can print everything from colour charts, to high quality photographs. Or, in seconds you can convert to extra high-speed black and white for finished business documents using the dedicated black cartridge with 128 print nozzles!



The BJC-80 fits in approximately half the space of a briefcase. The BJC-50 is approaching 50% smaller still.

## Optional colour scanner.

For greater portability, both models include an infra-red port for totally cable-less communications with any suitably equipped Windows® 95 notebook or PC.

And, if you really need the functionality of an office in the space of a briefcase, both models will accept an optional colour scanner head in place of the print

## Cable-less communication.

head. It takes only seconds to change the heads. You can then use the scanner head to acquire colour images, or for fax and OCR functions\*.

**Canon Customer Care.** All Canon printers feature a one-year warranty, upgradeable to three years for minimal cost, and are backed by Customer Care hot-line support. Drivers are available for DOS, Windows 3.1x/95 and Windows NT.

If you need help choosing between small, and smaller, give us a call on 1 800 021 167.

**Canon portable colour Bubble Jet™ printers**

**Canon**



*It's hard to determine how effective Internet optimisers are.*

# CheckIt NetOptimizer

**C**heckIt NetOptimizer is a set of tools designed to improve Internet access performance by testing and optimising modem and control panel settings. It also includes a comprehensive set of modem diagnostic tests, and utilities to test an ISP's download speeds and to easily back up ISP and modem connection settings.

Toolsets such as NetOptimizer often have an air of snake oil about them, simply because the promises they make are fairly ephemeral — it's difficult to quantify exactly what an improvement in Internet performance is because of the vagaries of the Internet itself.

Our first test of NetOptimizer Auto Tune-Up — the part of the suite intended to speed Internet connections, which we tested on an IBM ThinkPad connected to the Internet via an IBM 33.6K PC Card modem and a Big Pond Internet account — did nothing to allay these fears. The application's stated benchmarks post optimisation revealed the Big Pond connection returned around 2.3K per second; the pre-optimisation figure was 2.8K per second.

NetOptimizer Auto Tune-Up achieves its results by changing settings such as the Maximum Transmission Unit (MTU), which specifies the size of the packet sent by the modem; Receive Window (RWIN), which specifies the amount of data the computer is prepared to receive (TCP/RWIN, for those with an eye for detail); packet life, or Total Time to Live (TTL); and the Path of Maximum Transmission Unit (PMTU).

This last area is divided into two sub-components: Discovery, which attempts to determine the route between host and destination, which will allow the largest possible MTU to be sent without it being fragmented; and BlackHole, which tells TCP (transmission control protocol) to try to find routers that don't return 'fragmentation needed' messages. In essence, it maximises the number of times a given packet is re-sent on a given journey between client and host.

Auto Tune-Up has three modes: quick, advanced and manual. In addition, it lets the user specify which Internet account is to be optimised, as well as whether this optimisation should occur using the 'current' account. This option is presumably to be used if the NetOptimizer is run when the user is already online.

Advanced mode conducts the optimisation testing a number of times; quick mode simply runs the three-phase diagnostic once. Manual allows the user to change the settings without running any optimisation routine.

APC testing didn't reveal any real difference between advanced and quick modes, although it was noted that the



problems experienced with negative optimisation results only occurred when advanced mode was used in conjunction with a pre-established connection. Using the quick mode and specifying that Auto Tune-Up establish the connection yielded positive results, with a claimed improvement from 2.3K per second to 3.6K per second. It's worth noting that 3.6K per second is the maximum theoretical speed of the modem, and it's unlikely that this speed would be sustained for any length of time in a normal Web-access session.

Tune-Up optimised the test configuration by extending the packet life, expanding the maximum transmission unit from 576 bytes (the standard size for packets sent over the Internet) to 1,500 bytes, a size that is the default Windows packet size for use over LAN connections. Additionally, it changed the RWIN specification from 2,144 bytes to an open 'not specified'.

No reason was given by the application for making these changes, and although a technically literate, Net-savvy user could perhaps make deductions based on a reading of the log file, most people would have difficulty coming to any sort of concrete conclusion, even with the assistance of the Help system.

Based on these results, it's hard to

ascertain whether there was any real improvement in Internet performance — downloading the 6.5M Paint Shop Pro zip file from a NSW Tucows mirror on a Sunday afternoon took approximately 90 minutes, which is probably about average for a file of this size obtained from this location. There was no noticeable improvement in the times taken to load frequently used US-based sites.

The other suite components performed flawlessly; the modem diagnostic tool was particularly useful. It analyses around 20 different modem functions, including the AT command set, baud rates, dial tone and FIFO buffers to determine optimum settings. It also determines which version of Winsock and dial-up networking is being used, and in our case advised that later versions were available. Installing these later versions is a matter of logging onto the CheckIt site, running NetOptimizer and then letting it do the rest of the work.

ISP Benchmark, which rates the download of one 300K file from the user's service provider, is interesting as an exercise in connection speeds. It could also be useful for comparing ISPs during free sign-up periods.

The ISP connection data backup is also a useful tool, although such tools are available from shareware sites.

Overall, NetOptimizer is a useful package for users in minor support roles, or those who regularly use a range of computers whose performance parameters are unknown.

**Josh Gliddon**

## CheckIt NetOptimizer

<b>Distributor</b>	Mannacom
<b>Phone</b>	(07) 3870 4900
<b>Online</b>	<a href="http://www.checkit.com/products/fsenetoptimizer.html">http://www.checkit.com/products/fsenetoptimizer.html</a>
<b>Price</b>	\$49.95
<b>In short</b>	A reasonably useful package that will diminish in value over time.



# Brilliant colour, PhotoRealism and an extra large print head for faster blacks.

When it comes to versatility, the BJC™-4200 is ahead of its class.

**Four printing systems.** It accepts a choice of four different cartridge-based printing systems, designed to tailor your output to your printing needs. Two are included in the box as standard.

**Photo quality CMYK.** The first standard system is four-colour process printing, with driver settings for Economy, Text and Photo. The Canon Colour Image Processing System (CCIPS), and resolution up to 720 dpi, give you outstanding half-tones by combining pure and process blacks.

**Blacks at twice the speed.** The other standard system, specifically for black & white correspondence, is an unusual feature. It is a dedicated, extra large black ink cartridge with 128 print nozzles capable of printing two text lines at speeds up to 510 characters per second.

**Don't be confused.** Many manufacturers make all sorts of claims about pages per minute. But, in reality, using their own characters per second ratings, you'll find that the BJC-4200 can be more than twice as fast! (Also see output chart.)

**Canon's exclusive PhotoRealism.™** The third ink system uses Canon's exclusive PhotoRealism inks. This option is more than just a claim, it is fast becoming the photo

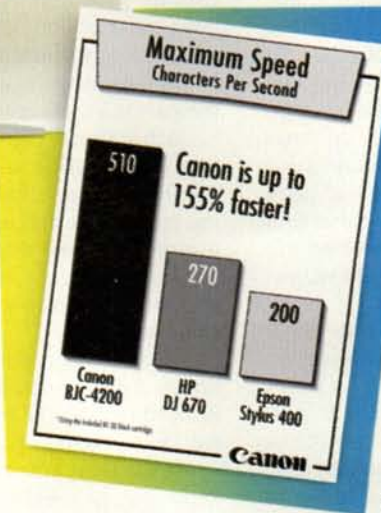
quality printing gold standard.

**500% more colour combinations.** Special low-density inks can vary the amount of saturation per pixel so that a single dot could have 0%, 33%, 67% or 100%. This produces up to five times as many colour combinations as conventional CMYK inks.

**Virtually no pixelisation.** The result is better half-tones and more subtle colour gradations, with almost no visible grain and dots, even in areas of low colour density.

**Canon Customer Care.** All Canon printers feature a one-year warranty, upgradeable to three years for minimal cost, and are backed by Customer Care hot-line support. Finally, our fourth ink system, Fluorescent ink, is also an option, and drivers are available for DOS, Windows® 3.1x/95 and Windows NT.

If you would like to learn more about tailoring the highly versatile BJC-4200 to your printing needs, in colour and B&W, call us on 1 800 021 167.



**BJC-4200 colour Bubble Jet™ printer – \$299<sup>RRP</sup>**

# Canon





We welcome comments and suggestions. Send correspondence to APC Readers' Say, PO Box 37, Sydney 1028; or by email to: [APC@acp.com.au](mailto:APC@acp.com.au). All correspondence becomes the property of APC and is subject to editing.

*Richard Walsh's article, 'Disconnecting with the Net' (see APC July, page 135), was always going to draw comment. Readers sympathised with his struggle to get his PC working, while the PC vendor, Dell Computer, had its own views. Following are a letter from Dell Australia, further contribution from Richard Walsh in response to a reader letter supporting Dell, and one from a Walsh computing soulmate:*

## Dell's reply

The article appearing in the July issue of APC by your former publisher has understandably generated quite a bit of feedback to Dell Computer via our Web site and directly to our call centre. There are a number of statements in the article, attributed to you [APC editor Jeremy White], concerning Dell's methods of delivery and installation that obviously set an expectation with Richard and Sue Walsh which, when not met, left them feeling disappointed. Unfortunately, some of the comments you made were incorrect.

It is unfortunate that Richard and Sue were led to believe that Dell provides onsite installation of individual PCs. This is not a service in demand and not one that we have ever provided free of charge. Secondly, our support team only operates from 8am to 8pm Monday to Friday as our call centre statistics show that our peak demand period is between these times and we therefore believe we are meeting the expectations of most customers. Most, but obviously as in this case, not all.

Richard's article indicates to me there was a possible error with the printer driver setup and there may have been an interrupt conflict between the modem and mouse. These are not hardware faults — as you would know, they relate to the software setup of the machine. Regardless, the thing wouldn't do what it was supposed to do and Richard's efforts to resolve his problems followed a frustrating path.

It is true that customers can spend a few minutes waiting on the queue to get access to a Dell technician. We strive to keep these wait times low and while waiting, play music that is hopefully pleasing to most. The technicians in our call centre typically resolve close to 90% of all problems presented to them over the phone, eliminating the need for a field engineer to

call. When field service is required, most people find it more convenient to have the engineer come to them, rather than having to bring their computer to Dell.

Regardless of whether it was Wang or Digital which conducted the field service, Dell Computer at all times remained responsible for the successful closure of this call and continued to work with both field service organisations until Richard and Sue were happy with the outcome.

It is no-one's fault that Richard Walsh did not know whether his phone line was analog or digital, whether it was tone or pulse dialling or if his home telephone is running through a PBX. To the lay person, these are highly confusing questions. But they are questions that have to be asked when dealing with highly technical equipment and they are ones the Dell technicians could have also helped him with.

Richard himself suggests he may have "inadvertently obeyed the wrong master on a couple of sensitive issues" in his "eager attempt" to get Windows 95 up and running. So, it happened. It may have been the cause of the problems he experienced. Regardless, we despatched two engineers onsite, naturally at no cost to the customer, to correct the problem.

Richard's article, while attacking Dell for not providing services that we have never provided, also hints at an underlying pleasure he and his wife have found by accessing the extraordinary world of the Internet. Hopefully, they will continue to experience years of satisfaction from their Dell hardware.

No-one likes a bad experience like this and as a sign of good faith, we'd like to offer Richard and Sue a free extension to their warranty or a free upgrade to Windows 98.

By the way, you might be interested to know that, as a result of customer feedback, we are now open on Saturday mornings.

**Robert Small**  
National Marketing Manager  
Dell Computer

## Response to Dell defender

*APC passed on to Richard Walsh a reader's letter which defended Dell. Here's part of Richard's reply:*

Let me say that I was not questioning Jeremy's (and your) judgement that Dell is

one of the best vendors of PC hardware. From what I hear, I could have done much worse than choose Dell.

The purpose of my article was not to shaft Dell but to question whether the computer industry as a whole is yet in good enough shape to meet the legitimate expectations of the non-tech population out there who want to get on the Net and expect it to be as easy as owning a car or a VCR.

**Richard Walsh**

## Support for Richard Walsh

Your story is a carbon copy of what I go through every time I need to install new equipment. I am reasonably computer literate and by no means stupid (or maybe I am), but it constantly amazes me how many pieces of new equipment just don't work in spite of following set-up instructions.

If it weren't for the fact that my son is in the computer industry and a computer and electronics nut to boot, half of the equipment I have ever bought would not be working today. He has even had problems installing equipment that is off-the-shelf and supposedly 'plug-and-play'.

How the average consumer fares is really beyond me. There must be a lot of 'sons' out there. Great article, by the way.

**Wally Gawronski**  
Internet

## Correction

The last line of the Editor's Choice box on page 110 of August APC was not printed because of a production error. The text should have read "... although you do have to pay for it."

## Editor's note

We're always keen to see our readers discuss the magazine and the direction it should be taking. If you have any comments on the magazine, please write to or email APC Readers' Say, or go to [apc-mag.com/mymag/](http://apc-mag.com/mymag/) to have your say and participate in discussion forums.



A2

A3

**W**hen it comes to superior paper handling, the BJC™-5500 has no rivals.

**More paper feeds.** It comes with a tractor feed to accept continuous form (computer paper), and a manual feed for cut sheets up to A2, or envelopes. To this you can add two optional cut-sheet feeds so, for instance, you could have letterhead and standard paper feeds at the same time.

**To do more jobs.** Obviously the BJC-5500 has the paper handling for almost every one in the office from accountant to artist, and engineer to receptionist. Its appeal is further

The Canon BJC-5500 can do something that no other printer can,  
**print more paper types.**

Envelopes

Overheads

Computer

A4

broadened by the fact that the BJC-5500 is also an exceptional four-colour CMYK printer capable of producing text and graphic lines in resolutions up to 720 dpi.

**At higher speeds.** Whether it's a long spreadsheet, or a batch of form letters, the BJC-5500 delivers. Using the special black cartridge, the BJC-5500 prints close to 7 B&W pages per minute in high speed. It even offers an ultra efficient Economy Mode that reduces ink consumption by 67% vs. High Quality mode.

**Canon Customer Care.** Like all Canon printers it features a one-year warranty, upgradeable to three years, and is backed by Customer Care hot-line support. Both colour and B&W cartridges are included as standard. Drivers are available for DOS, Windows® 3.1x/95 and Windows NT.

To find out more about Canon's exceptional paper handling capabilities, call us on 1 800 021 167.

**BJC-5500 colour Bubble Jet™  
printer – \$1499<sup>RRP</sup>**

**Canon**





## Spare me, please!

*If junk mail signifies trees that died in vain, what metric should we apply to the self-indulgent dross that fills the infinity of cyberspace?*

**By Helen Dancer**



One of the most pressing editorial problems we face at APC is squeezing the number of articles we want to give you into the pages we have available. Paper is an expensive commodity, and although it's an eminently browsable medium, especially at magazine rather than broadsheet size, it has its necessary physical limitations.

When we first launched **apcmag.com** and started looking at the magazine we publish as a three-way, multiple media construct, our first realization was that we could now create as much information as we wanted, cover all the side issues and related case studies, and publish interviews as long as your arm. We were able to increase the value proposition exponentially. Time, rather than space, became the limiting factor.

But of course it doesn't work like that. The very function of the editing process is to apply strict quality-control measures, and part of the skill is in determining when enough is enough. A landmark example was an interview with Vinton Cerf, written by Dan Tebbutt, which was published in January 1997. On paper it filled two pages but on the Web it clocked in at 13,000 words. Cerf's a truly fascinating man and Dan's approach was faultless, but even the most fascinating piece of prose can't hold a reader through 13,000 onscreen words at one sitting.

We had lots of feedback that it was a great article, and that it teased out a lot of on-the-money issues. We even went onto required reading lists at tertiary institutions. But without exception the sheer volume of words was an issue.

So cyberspace is infinite, and as we go we learn how to use it, respect it and tread gently.

Now, last time I was bold enough to make a value judgement about what's *worthwhile* on the Web I received a veritable avalanche of people suggesting politely and otherwise that the easiest fix for 'people like me' is the off button. So take it as a given that I know that (thank you), and if you care to, read on.

I attended a lecture in May by the erudite and entertaining Mammen Mathew, editor of *Malayala Manorama*, one of India's most popular daily newspapers. During that hour he coined what is for me a ringing catchphrase: the JenniCam generation.

The eponymous Jenni is of course Jennifer Ringley, and I guess I blame her for setting the original benchmark in what is a growing volume of 'This Life'-style stuff appearing on the Web. A month or so back we saw the first live birth on the Internet (well, that's how it was billed; the reality was more knees and doctors' backs, so I'm told).

Yes, I exercised my off-button prerogative and nobody forced me to tune in, so I heard about it second and third-hand. I wasn't offended or nauseated by what is after all a perfectly natural phenomenon.

But what a bandwidth-busting waste of space! For any real value, why not use one of the more reasonably useful media available, such as video cassette, or CD, even DVD. If the real value in 'televising' such an event was teaching, then there are heaps of better ways to transmit the information than the groaningly slow Internet, and if not, then it all resembles a self-indulgent episode best described by a word that rhymes with tank.

Watching a halting camcorder view of a woman giving birth on the Internet does not equate to watching the first man walk-

ing on the moon in a grainy black-and-white TV picture, trust me.

I'm not advocating the perpetration of the Edwardian notion that childbirth amounts to 'secret women's business'. But I really do believe that, apart from showing little respect for the subject matter, and displaying absolute ignorance of the reality that childbirth is a precious, special and emotional experience, which cannot be accurately conveyed in any broadcast medium, from a multiple media publishing point of view, the choice of medium was both sad and bad.

The JenniCam generation then threatened to chart new waters (do I mean plumb new depths?) with the announcement that a couple of teen-somethings (complete with legal eagle and publicity machine) planned on consummating their relationship online.

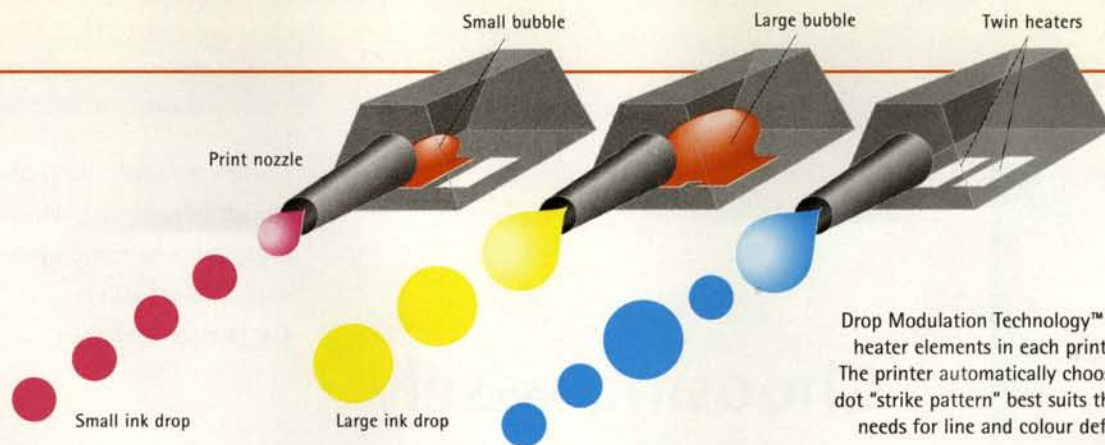
We were told (by press release, from aforesaid publicity machine) that the couple wanted to make the broadcast as a signifier of their belief in freedom of speech. Their lawyer pledged to keep it "grass roots and intimate". Yeah right, and my name's Ted Turner.

While the announcement was soon exposed to be a cheap hoax, the oxymoron of intimacy and worldwide broadcasting is as mind-numbing as trying to figure out the value of doing it in the first place.

Forget the cynicism expressed from the outset as to whether they were in fact even a couple, who was funding the site and what financial benefits might have accrued to them both from the staging of the event; the more fundamental question in my mind was *Who Cares?*

There are untold amazing, valuable, brilliant uses for the Internet. But these are not part of that panoply. ■





Drop Modulation Technology™ uses two heater elements in each print nozzle. The printer automatically chooses which dot "strike pattern" best suits the image's needs for line and colour definition.

## Big and little ink drops reduce speckles and smooth colour gradations using Canon's Drop Modulation Technology.

Common colour printer technology uses four inks (cyan, magenta, yellow and black), produced in a single drop size.

These inks are mixed to create eight possible colours in a single address position, called a pixel. Then, to give the impression of more

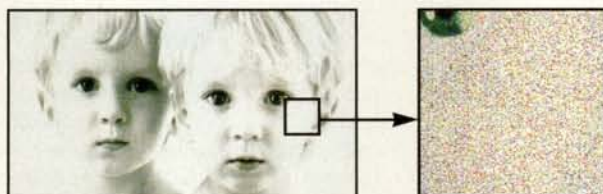


Diagram 1. Standard CMYK inks with a single drop size can produce only 8 colour combinations. This can result in pixelisation as represented right.

colours, the printer puts different colours in adjoining pixels. At a distance, this can look pretty colourful, especially at high resolution.

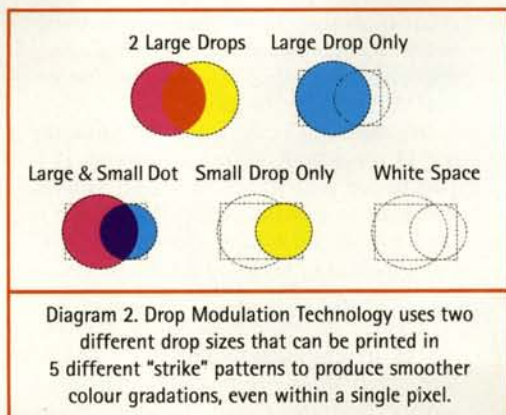
But there are problems in all of this.

High resolution slows the print process. And no matter how many pixels you have in a square inch, there is a limit to how subtly the tones can graduate. As a result, photographs often show something called "pixelisation," which is technical talk for "little speckles" (see diagram 1).

So Canon developed Drop Modulation Technology, which is now available on several colour Bubble Jet™ printers using either standard and/or PhotoRealism™ inks\*

It uses two different ink drop sizes, large and small, that can be combined in any of five different "strike patterns," within a single pixel. As diagram 2 shows, this has the effect of producing a wider variety of colour combinations within the pixel itself. Then, because the effect is an automatic function of the printer driver, it is not dependent on super high resolution.

The non-technical way to put this is that big and little drops help produce smoother lines and better colour gradations, plus less of something you don't want to see at all – speckles.



And, allowing for the complexities of colour in the first place, it all happens with reasonable speed.

**Canon Customer Care.** All Canon printers feature a one-year warranty, upgradeable to three years, and are backed by Customer Care hot-line support. To learn more about the models offering Drop Modulation Technology, call us on 1 800 021 167.



Drop Modulation Technology is available with the BJC™-50, BJC-80, BJC-4300 & BJC-4650

**Canon**





## Choosing wisely

**I** shouldn't gloat, but it's hard not to when you see someone like Al Dunlap, the staff slasher king, get fired. I just can't quite repress a warm self-righteous glow.

Chainsaw Al was for a time head of the publishing business that puts out this magazine, but he didn't have much impact down in the bowels of the organisation where I worked at the time. Maybe Australian Consolidated Press was already lean and mean, or maybe he was only on a working holiday here in Australia.

Whatever the reason, I was not really aware of his techniques until he returned to the US. Now, several companies later, he has run foul of the board of Sunbeam. Apparently, he failed to deliver the results he promised.

The Shredder's demise is a signal for a re-examination of the management technique of which he was the most outstanding exponent. Downsizing is or was not quite the success some senior executives might have you think. The evidence is mounting that downsizing has had little impact on costs but has had a considerable and negative impact on morale, flexibility and innovation.

Studies of companies that have downsized show that while the process may deliver short-term gains, in most cases those gains are not sustainable. While some companies do benefit from this process, these companies are, it appears, in a minority.

But downsizing is not the only management buzzword that has failed to live up to expectations. There are dozens of ideas or techniques that at one stage or another have been hailed as 'the answer': business process re-engineering, network management, managing for quality or total quality management and the learning organisation are just some.

There is nothing wrong with these ideas or approaches. Each one stems from valuable insights into modern organisations and how they behave. The trouble is that they become silver bullets. They are treated as the single solution that, if applied correctly, will improve performance profitability and so lead to organisational heaven.

The specialists who prescribe these solutions are like surgeons who treat every stomach-ache as appendicitis. Organisations are complex systems and there is usually no single, simple answer, however attractive it might be for a board to believe that when it appoints a new managing director. Of course, some cases of stomach-ache are caused by appendicitis and so surgery is appropriate. But these cases are much rarer than the surgeon might have you believe.

Any managing director worth their salary should be aware of all the management tools they have available to them. Rather than being an exponent of just one approach, they should select and use the tool that best fits the job.

It's the same when it comes to managing IT projects. After all, managing IT is part of the general management process. It's done on a smaller scale than some of the approaches I have discussed above, but it is also key to the long-term success of an organisation.

There's no single right set of technologies or an approach that fits every task. In fact, often there are many choices, each with advantages and disadvantages. Choosing a technology and an approach to solving the problem is a matter of weighing up these different factors.

The IT management equivalent of downsizing is outsourcing. Most outsourcing deals involve staff loss, although outsourcing can also be used to focus staff on new development while

*There's no such thing as a standard problem, which makes it impossible to come up with a standard solution.*

**By Jeremy Horey**

passing maintenance and legacy systems to the external service provider. In some organisations outsourcing is seen as the solution to all problems. In a few it is, but in most the hard work of managing an IT department is turned into the hard work of managing the relationship with an outsourcing company. The illusion of extra flexibility is dispelled by the detail at the bottom of the contract.

In some situations the flavour of the month, Internet technologies, can deliver great benefits. But in other places they are inappropriate. The Internet approach is flexible, highly modular, standardised and open. These technologies are good for distributing information or coordinating workflows. However, they are inappropriate for applications like manufacturing automation, which are time sensitive.

The trouble with managing IT is that we try to fit new problems or challenges into the frameworks that have worked for us in the past. For example, Lotus' Domino system makes it very easy to build certain kinds of Web sites. If I've spent a lot of time developing expertise in Domino, I'm going to see Web sites as something that should be done in Domino. On the other hand, if I've spent a lot of time learning Microsoft's Active Server Pages (ASP) technology, then I am going to see the solutions to challenges in building a Web site in terms of ASP.

The real challenge in any management role is to step back and see the arguments on both sides. It's very rare that you will come to an open and shut case. If you have what you think is an open and shut case, pause a moment and think. It may well be that you are seeing the problem through a filter that ignores key parts of the issue.

You can contact Jeremy Horey at [jeremyh@techtalk.com.au](mailto:jeremyh@techtalk.com.au)



# Only Canon offers a way to acquire and print images in colour with a printer and scanner in one!

Canon has a unique solution to a question that has often plagued colour printer users. How do you get the image in, so you can output it to your Canon colour Bubble Jet™ printer?

**Only from Canon.** It is an optional scanner head that fits right into your printer, and it is available on several models for just \$149<sup>RRP</sup>

It takes only seconds to replace the print head with the scanner head. This then allows you to acquire images for storage, editing, manipulation, placement on the Internet, or even OCR and faxing, with the right software.

**Easy to use.** To get you started, Canon includes image acquisition and editing software with your scanner head purchase at no extra cost! And using it, you can scan full colour or 256 grey-scale images in resolution up to 360 dpi. Or you can use high-speed

mode if you simply want Black and White at 90 dpi, supported by most fax software.

Best of all, Canon offers a full range of models with this remarkable functionality. They are the BJC™-50 and BJC-80 portable printers, the BJC-4300 and BJC-4650!

**Canon Customer Care.** All Canon printers feature a one-year warranty, upgradeable to three years for minimal cost, and are backed by Customer Care hot-line support. Printer drivers are available for DOS, Windows® 3.1x/95 and Windows NT.

If you would like to learn more about how to get your printer to input as well as output, call us on 1 800 021 167.



The BJC-4300 with PhotoRealism.



The portable BJC-80.



The even smaller, portable BJC-50.



The BJC-4650 for Windows and Macintosh and sizes to A3.\*

Optional scanhead – just \$149<sup>RRP</sup>

**Canon**

\* Available approximately August. Price shown is the recommended retail price including tax. 1. Compatible with Windows 95 only. Canon and the Canon logo are registered trademarks and Bubble Jet and BJC are trademarks of Canon Inc. Windows is a trademark of Microsoft Corp. in the U.S. and other countries. Canon Australia Pty Ltd ACN 005 002 951 CS/5332





## Managing virtual workgroups

*With the convergence of computers and communications, organisations can link people and teams across boundaries. But managing these self-directed teams presents challenges for many people.*

**By Cathie Kennedy**

**I** recently attended a workshop on Building Effective Teams. At first glance, the course outline appeared to include all one would expect — group dynamics, resolving conflicts, empowering team members, creating self-managing and self-motivated teams.

But during the two days, I realised the instructor had failed to consider a critical component of managing teams as we head towards the new millennium.

The material presented was based on the assumption that we worked with people in the same physical location. It failed to address how we work with a team whose members may never meet face to face; a team consisting of people based in a remote location, a home office, an interstate office, or dispersed around the globe. Some with different cultural experiences, living in different time zones.

So how do we accomplish the very '90s philosophies of facilitation, motivation and creating a vision in a digital world? The ability to harness a virtual team's creativity towards a common goal calls for a very different set of skills compared to those required when working with a physical team.

The behaviour of traditional workgroups reflects tribal communities, which have prescribed rules of kinship and social relationships. Status within a tribe typically depends on age — tribal elders are revered, and initiation rites and totemic ceremonies are an integral part of the culture.

So too is the case in many of today's workgroups and organisations. Status is often determined by age and experience, and there is an unstated expectation that new employees or group members will need to demonstrate their abilities and prove their commitment before being accepted as a peer. Indeed, many organisations have a three-month trial period.

But age, race, status and sex are trans-

parent in cyberspace, where people are judged on current contribution and prior achievements rather than hierarchy and age. This represents a fundamental shift in the way teams form and operate.

The convergence of computers and communication has allowed corporations to deploy people with the very best experience and skills to work on a project, irrespective of their physical location. As a result, many virtual workgroups are temporary entities, forming to complete a specific task under an agreed relationship and then disbanding and moving on to another project.

The concept is not new. The movie industry, for example, has operated under this model since the very beginning of its existence. A team of people best suited to each role — actors, directors, producers, set designers, editors, camera operators, stunt people, lighting technicians, make-up artists — come together to produce a film. Filming, the addition of special effects and post production may be completed by people in different countries, yet all are totally committed to the project and take full responsibility for the outcome. Actors are typically selected on the merit of their last project rather than years in the industry; they're only as good as their last movie.

For many in the corporate world, however, this model is unfamiliar. Our success will surely depend on how well we leverage not only smart technology, but smart people.

We also need to understand how to live and work in a world where electronic rather than face-to-face communication reigns. In its current iteration, communication on the Internet is predominantly text-based, whether it be synchronous or asynchronous. For many, the absence of visual cues and voice intonations is disconcerting. Understanding the codes of behaviour and idiosyncrasies of the new medium can be as challenging as learning a new language.

It will have a significant impact on the way people view their role within the organisation. People often need a sense of belonging, and the human companionship of the existing workplace provides this through physical interaction.

But lack of direct contact will only be a barrier if we choose to let it. You only need to witness the growing number of Net marriages to know that you can still communicate ideas, exchange knowledge and form relationships in cyberspace. As any chat room junkie will attest, it is possible to foster a sense of *esprit de corps* among regular participants, just as in other forms of communities.

All these skills will be intuitive for the children who are growing up in a digital world. Dubbed the Net Generation by author and social commentator Don Tapscott, tomorrow's workforce will thrive on collaboration in cyberspace, so much so that they are unlikely to function within the existing systems, processes and structures so entrenched in many of today's organisations. Innovation, creativity, independence and autonomy will be the foundation of their behaviour.

By the time they begin their career, the Net Generation will have assimilated the skills required for virtual workgroups. And proficiency in using the technology will come intuitively. Our generation, on the other hand, is struggling to accommodate those skills.

It's not surprising then that the thousands of courses and books available on building effective teams fail to address virtual workgroups, which have a heavy reliance on electronic communication. Perhaps we have something to learn from the Net Generation, which is increasingly gathering online to chat and for recreation. They are successfully forming webs of relationships in cyberspace, and thrive on collaboration. The challenge for our generation still lies ahead. ■



If you can't find  
what you need to know  
in this magazine  
you'll find it here



**DYMOCKS**  
BOOKSELLERS





## Where computers go to die

*When old computers kick the bucket, their spirits aren't necessarily laid to rest.*

**By Bruce McCabe**

**B**ack in June I wrote about the 'trickle down' effect that takes place in the world of personal computers. Old models are resold and recycled through the second-hand market, finding their way into less demanding applications as they are replaced by newer models. At Gartner Group we are able to observe this effect quite closely — up to a point. The mystery lies in where computers end up at the very end of their lives. What happens to the really old machines, which must number in the hundreds of thousands, that are taken out of circulation each year? Somehow I knew they didn't all end up as landfill, and I asked if anyone else had any clues.

The emails have come thick and fast from readers letting me know of the fate of machines they have come across. A great many provided examples of individual machines that would be considered dead by most of us but were still soldiering on. The odd 386, several 286es and a score of XTs were mentioned. Many of these were installed in homes, dedicated to the sole function of home accounting or record-keeping. Others were doing a sterling job running small businesses — XTs had been spotted running both a hairdressing business and a tennis club.

The prospect of running one of these dinosaurs with only 640K of RAM and a 5.25in floppy sends shivers down my spine, but only because I relate it to all the tasks I depend on my PC for today. When you stand back and think for a moment, dedicating one to a single function isn't such a bad idea, especially when it costs practically nothing. It was also clear that dot matrix printers are still doing an awful lot of work

printing invoices and receipts, and one reader employed his as a heavy-duty paperweight for old magazines.

Some more creative applications were mentioned, such as using old PCs to train people on hardware assembly and service. The cases, cards and components were all real, but it didn't matter if any got 'zapped' or broken. My personal favourite application for an old PC no longer fit for its original function was — wait for it — leaving it running in a spare room to stop mould from forming on the wallpaper! I bet the R&D guys at IBM never thought of that one.

All the individual sightings were interesting (and, sometimes, downright funny) but hundreds of thousands of PCs they were not. I wanted to know if anyone had spotted a mountain of the darn things. Had any APC readers stumbled across a real 'boneyard'. Every now and then an email came in that provided another clue. One described an intriguing extra step in the 'trickle-down' process: old PCs are being exported in some numbers to destinations such as Africa, where cost is a considerable barrier, and put to good use. Working PCs are often made by cannibalising multiple non-working units.

One email, from a retailer in country Victoria, pointed out that many of its customers were on low incomes and held onto old computers for word processing. To support them the shop keeps XTs and 286es for parts. Another described a terrific character who operates an antique shop in Gilgandra, central NSW. He wears an earring and apparently resembles a pirate, and has taught himself computing in the past 12 months and sells old 286es, 386es and 486es to the locals, bringing them out from a Sydney

warehouse where he has hoarded a mountain of them!

Ultimately, however, when all was said and done, landfill was mentioned most frequently as the final resting place for hardware.

Unfortunately, buried doesn't mean forgotten. Last June I mused about the difficulty of recycling components from current designs and one email went to some length to explain the environmental consequences of dead computers. It was from a South Australian business that specialises in recycling obsolete business equipment of all kinds, and they were kind enough to forward additional information from Greenpeace on the subject (see APC December 1997, page 74). Apparently, toxic components from PCs, such as cadmium, PVC, heavy metals and flame retardants, seep out of landfill and cause their own environmental problems.

They also claim that 100,000 tonnes of 'toxic computer waste' is shipped overseas each year, and Australia has been guilty of dumping it on its Asian neighbours. Correspondence relating to two disputes was attached. One of these detailed the impounding of two 40-foot containers sent from Australia to Manila in 1994. The other was the seizure of three containers of similar material (mostly circuit boards and cathode ray tubes) from a vessel in Hong Kong harbour in late 1997. In both cases the Australian Government came under fire for a lack of action.

So now I have a little more insight into where computers go to die... but I've also discovered they can come back to haunt us.

**Bruce McCabe is senior industry analyst with Gartner Group/Dataquest. He can be contacted at [bruce.mccabe@gartner.com](mailto:bruce.mccabe@gartner.com).**





**Windows 98 Black Book**  
A must for pros implementing Microsoft's Windows 98. Details all the new features, including the differences between Windows 95 and 98, and vital upgrade information, including caveats and warnings.

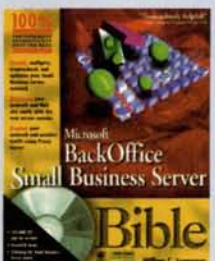
\$89<sup>95</sup> PB



**Master Windows 98 Visually**  
The ultimate step-by-step guide covering beginner to advanced features of Windows 98. User-friendly strategies for using operating systems capabilities like shortcuts, folders, and backup.

Includes a CD-ROM with a fully searchable Acrobat version of the book.

\$89<sup>95</sup> PB



**Microsoft BackOffice Small Business Server Bible**  
Your prayers are answered with this hands-on guide to the installation and support of this hot new server. The bonus CD-ROM includes dozens of SMS system management utilities, sample files and system enhancements.

\$89<sup>95</sup> PB



**Photoshop 5 for Windows Bible**  
Whether you're a beginner or a master, you'll love this step-by-step guide showing Photoshop in action, everything from working with layers to customising graphics for the Web. Includes a CD loaded with heaps of helpful material.

\$110<sup>00</sup> PB



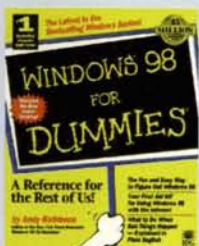
**Instant HTML Programmer's Reference**  
Your complete guide to life and the universe as far as HTML is concerned. This is for the pros, developers who need to know the advanced features of the language, plus VBScript and JavaScript.

\$39<sup>95</sup> PB



**The Year 2000 Software Crisis: The Continuing Challenge**  
You'd have to have your head buried in the sand not to have heard about the Year 2000 Millennium Bug. Despite all the headlines, most companies and government agencies aren't prepared for the impending crisis. This book discusses the global implications and - thankfully - provides various solutions. Essential reading for anyone in danger of catching the bug.

\$59<sup>95</sup> PB



**Windows 98 for Dummies**  
Forget the hype and read the sequel to the best selling computer book of all time, Windows 95 for Dummies. Covers the active desktop, integration with Internet Explorer 4 and new broadcast and video options. Excellent.

\$44<sup>95</sup> PB



**Windows 98 secrets**  
Shows you how to get the most out of Windows 98, including shortcuts and features like the Active Desktop as well as coverage of on-going Windows issues such as hardware and network configuration. Includes a fab CD.

\$110 PB



**Building Applications with Microsoft Outlook 98**  
Learn about all the amazing possibilities of Microsoft Office 97's advanced desktop information manager in less than a day. Fully integrated personal information tools such as electronic mail plus customising groupware scenarios are included. Comes with a CD.

\$89<sup>95</sup> PB



**Microsoft Windows 98 at a Glance**  
The fast way to learn all the tricks to using Windows 98. Topics include programs, menus, files and folders, Windows Explorer

and Internet access. Plus Web View and the Active Desktop.

\$39<sup>95</sup> PB



**Microsoft Windows 98 Resource Kit**  
If you're a systems administrator or IT pro, this technical guide is for you. 1,500 pages of vital info. for running Windows 98. All the tools, utilities and accessory software you'll need are on the CD.

\$160 PB



**Microsoft Windows 98 Step by Step**  
You'll be a Windows whizz in no time with this personal training system. Includes real world business examples and practice files on CD.

\$69<sup>95</sup> PB



**Running Microsoft Windows 98**  
An in-depth user reference that thoroughly covers Windows 98, from installation to maximising productivity. Megabytes of information on new Windows 98 features plus a CD with a searchable version of the book.

\$89<sup>95</sup> PB



**Multimedia Making It Work**  
Learning about something as multi-faceted as multimedia requires a simple, step-by-step approach such as this one. It teaches you about the components and processes so you can begin building your own projects from simple boardroom presentations to dynamic corporate CD-ROMs and web sites.

\$89<sup>95</sup> PB



**Windows 98 Made Easy**  
Make life easy for yourself with this simple Windows 98 roadmap. Instead of getting lost in complicated routes, it points you in the right direction with go-at-your-own-pace tutorials, expert advice and in-depth explanations of operating system concepts.

\$44<sup>95</sup> PB

All the Answers to your computer needs.



**DYMOCKS**  
BOOKSELLERS





## Unemployment: invisible insanity

*Should unemployment be seen as a natural disaster or an unbelievable opportunity?*

**By Julian Ehrlich**

**C**omputer recognition of human language is very complex. In the 1960s Americans and Russians apocryphally and uncharacteristically collaborated in the first serious venture in computer recognition of human language.

The objective was automatic translation of United Nations speeches. The ingenious stage one test involved typing a sentence in English for automatic translation into Russian, and then retranslation back into English. Comparison of the original English sentence and the translation would indicate the technology's viability.

'Out of sight, out of mind' was typed in. After much light-flashing and relay-clicking (it was the 1960s, after all) the Russian linguist raised an eyebrow at the Cyrillic output but carefully re-entered the text for further processing. More flashing lights and clicking and the system duly produced 'invisible insanity'.

Unemployment is one of those socially generated phenomena that satisfies both input and output criteria of that translation experiment, being both forgotten and crazy when not immediately obvious. The horrific cost drags at the victims' souls and erodes everyone else's morality. The astronomical financial cost is uncalculated.

Economic bumbles are enormously costly. The Japanese economy has been subjected to policy failures, bankruptcies, and formidable losses from untimely sales of assets at home and abroad. Recent calculations estimate Japan's mistakes will cost its economy twice as much as World War II did.

Recent calculations place the total cost of year 2000 conversion as greater than the financial cost of the Vietnam War.

So what is the cost of Australian unemployment? Why do we know the cost of wharf delays but not the cost of unemployment? Why don't we respond to the social disaster of unemployment in the same way as we respond to natural disasters? Where

is the emergency housing, the counselling and the media attention?

The simple arithmetic is that there are vastly more people than there are available jobs. Send all the alleged dole bludgers to Antarctica, force everyone else to move to be near the jobs they are compelled to accept, and there would still be several hundred thousand people, by any estimate, who do not have work.

Our failure — the failure of our governments and oppositions — is that their ideas about how to deal with unemployment are stuck rigidly in the 1960s or some earlier epoch. Their appreciation of what computing and communications technologies can do are feeble to nonexistent. Their strategies are captive of the hand-out mentality — handouts to unemployed, handouts to

Our antiquated response to unemployment means that Australia has no national program for managing our greatest source of wealth — task competencies. An employer can't access an 'http://www.taskprofiles.gov.au' to find the combination of tasks that research demonstrates are best grouped into a particular type of job. There is no 'http://www.competencyupgrade.edu.au' for people to find the specific short course that would extend their particular competency from Grade B+ to Grade A- to qualify for that new position.

Federal Cabinet plots to resolve yesterday's ideological obsessions instead of luring foreign companies to the pool of unemployed in this region or that city, which contains precisely the skills required for their advanced manufacturing process.

**We have massive computer power at our disposal, creating truly vast opportunities for dealing creatively with unemployment.**

industry. They try to ameliorate these handouts by simplistic 'work for the dole' schemes and often empty boasts about 'supporting business'.

But the 21st century beckons. We have massive computer power at our disposal, creating vast opportunities for dealing creatively with the social evil of unemployment. It is time to act.

A 'job' is actually a collection of 'tasks', with the specific assembly of tasks in a job often being coincidental, as the same task will appear in many different jobs. To be able to successfully complete a task, a person must have a 'task-related competency'.

This is very important. Your job may disappear, but your underlying task competencies remain. Your job as a blacksmith may evaporate, but your task competencies make you an ideal candidate for some retraining to become a car mechanic.

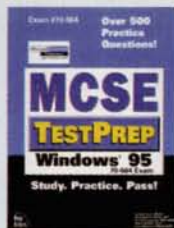
Shortfalls in specific, identifiable competencies could be addressed by onsite training.

Programs to convert rare, experienced, highly task-competent people into trainers are needed. Instead of elevating task competencies in the clothing, footwear and textiles industries to compete with Italy at high prices, we despair of competing with Thailand at low prices — and close up shop.

The program I am suggesting is expensive. It is data intensive. It requires steady, long-term funding for serious computer power, sophisticated Web technologies, and heavy underlying communications infrastructure. It means deploying our intelligence and technologies to *do* something instead of shuffling money and the arguments around and around . . .

Join APC's Interactive forum on this topic at <http://apcmag.com/interactive>.

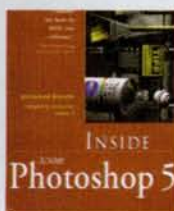




**MCSE TestPrep: Windows 95**  
A great alternative to forking out a huge amount of money for a MCSE exam course. It tells you only the essential information you need to pass the Windows 95 exam so you don't waste time or brain space. Hundreds of sample test questions plus insider

tips from a team of MCSEs and Microsoft Certified Trainers.

**\$49<sup>95</sup> PB**



**Inside Adobe Photoshop 5**  
Photoshop 5.0 is really quite different from the previous versions so you need a guide like this just to keep up to date. You'll like the step-by-step approach and all the tips and tricks. It will appeal to those who want to push their capabilities as far as possible.

**\$99<sup>95</sup> PB**



**Special Edition Using Office 97 with Windows 98**  
Business and home users who don't need a full Special Edition on either of these two products will find this combo just right. Because it covers Office and Windows together,

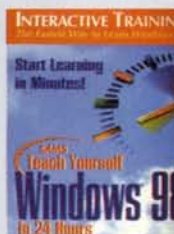
you won't have to buy two books. Think of the savings!  
Craig,  
City Business & Education, Sydney

**\$79<sup>95</sup> PB**



**Mouse Art**  
Now this is fun. If you've never looked at the computer as an artist's tool before, take another look. This activity book takes you through the key principles of line, shape, colour, texture and tone, using animals, people, environments, fantasy and transport as your themes. Great fun.

**\$22<sup>95</sup> PB**



**Teach Yourself Windows 98: Interactive Training**  
Evelyn Dow from Bentley College felt this was the "Best product I've ever seen. When I evaluated this, the competition's product went in the trash." You can see why she gave it such a glowing

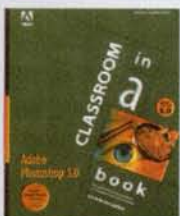
report. Video demos coach you while you work and you learn by visual example. Fantastic.

**\$49<sup>95</sup> PB**



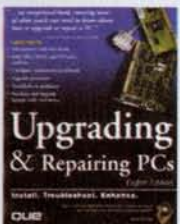
**Sams Teach Yourself MCSE Windows 95 in 14 Days**  
Do it all in two weeks with this excellent study tool. Each chapter begins with a quick overview of all the important facts covered and ends with questions and an exercise section for hands-on review. It's well organised and makes learning easy.

**\$59<sup>95</sup> PB**



**Adobe Photoshop 5 Classroom in a Book**  
If you have used the previous bestselling edition of this book, you'll know how good it is. The tutorials are better than any other Photoshop titles available - they're in short, focused lessons, and together with the CD, readers get hands-on experience mastering Photoshop.

**\$79<sup>95</sup> PB**



**Upgrading & Repairing PCs**  
Be your own computer mechanic with the most complete, up-to-date reference guide on the market. It shows you how to assess your system, install hardware and troubleshoot problems. You get the good oil on state-of-the-art motherboards, processors, memory and disk drives. It's got the lot.

**\$99<sup>95</sup> PB**



**MCSE Core Collection Box Set**  
It's all here, everything you need to know to pass Microsoft's MCSE certification track. The set includes four outstanding books plus a CD-ROM. It's a great deal at only \$299.

Good luck with the exams!  
Gary,  
Professional & Technical, Wynyard

**\$299<sup>00</sup>**



**Visual Basic 5 Unleashed, Professional Reference Edition**  
If you're a Visual Basic programmer, you'll love this fantastic reference. It covers everything, from creating and using ActiveX controls to creating Wizards, adding and controlling RDO, tuning and optimisation. Includes a CD.

**\$99<sup>95</sup> PB**



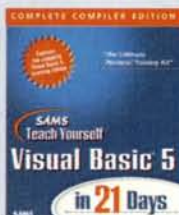
**Microsoft PC Hardware Library, Vol 1**  
Undoubtedly the most complete documentation of PC hardware available anywhere - perfect for repairing, troubleshooting, upgrading or building systems. Includes the Hard Disk

Guide, the Network and Modem Communication Guide and the Motherboard Guide.

Great for pros, hobbyists and educators.

Bruce, Rundle  
Mall, Adelaide.

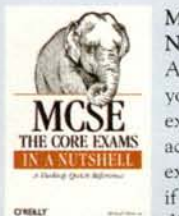
**\$219<sup>95</sup> PB**



**Sams Teach Yourself Visual Basic 5 in 21 Days: Complete Compiler Edition**  
Visual Basic is by far one of the easiest programming languages to learn so it's realistic you'll be able to teach yourself in three weeks. This boxed set

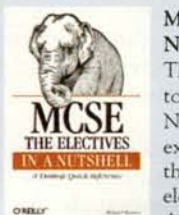
includes the bestselling tutorial book plus the full learning edition of Microsoft VB 5. It's an all-in-one job that does the job!

**\$129<sup>95</sup> PB**



**MCSE: The Core Exams in a Nutshell**  
A smart way to swat up for your MCSE or MCSE+Internet exam. Perfect if you're an administrator with some experience of Windows NT or if you're administering a different platform such as UNIX and want the next best thing to real life experience.

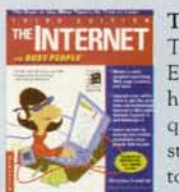
**\$44<sup>95</sup> PB**



**MCSE: The Electives in a Nutshell**  
This is the companion volume to MCSE: The Core Exams in a Nutshell. It covers the elective exams for the MCSE as well as the Internet requirements and electives for the MCSE+Internet. Aimed at sophisticated users who need a bridge between real-world experience and the MCSE exam requirements.

Not available until September.

**\$44<sup>95</sup> PB**



**The Internet for Busy People**  
This book lives up to its title. Everything's presented in a highly visual manner so you quickly get the idea. There's stuff on the latest browsers, tools and technologies, how to send private email and search for live news broadcasts. Create simple Web pages or full-on dynamic HTML whizzy ones. Get busy!

**\$39<sup>95</sup> PB**

All the Answers to your computer needs.



**DYMOCKS**  
BOOKSELLERS





## The peripheral that isn't. The network that is

*I just got back from a press conference where I heard the most amazing thing. I was told that peripherals wouldn't be peripherals any more, they would become centrals.*

**By Jeremy Torr**

**P**eripherals will no longer be peripheral. PCs will become the peripherals, not the central core of operations. James Fewtrell, head of PR at Canon Australia, delivered this forecast, and despite somewhat confusing syntax, the message was quite clear. Forget the computer as an engine for processing. Forget knowing how to use a program, set up a network, understand a connection protocol.

Enter the smart device that transparently operates on the data, image or multimedia being transmitted, and allows users to just work on the subject at hand. It will give no idea when, where or how the transmission is occurring, only that information is being transmitted, received or shared. Likewise, it won't matter whether that transmission is coming from the hard disk archive under the desk or a Net-based server on the other side of the world.

Not that it was actually important in the first place. It's just something we pro-peller heads have made important. Do we check the quality of the paper in a book, find out where it was printed, or ask what typeface is used before we read it? No, because they are all equally unimportant. The message is the important bit. And if Mr Fewtrell is to be believed, this is what we can expect in the near future.

OK, I'll forgive you for thinking this is a beat-up for a whizz-bang marketing push by a large corporation that expects to sell bucketloads of equipment if it can convince us all that its smart peripherals — sorry, non-peripherals — are the way to go for any future network. But similar rumblings are abroad elsewhere in the industry.

Hewlett-Packard is already using the Web as a supernetwork to monitor, control and operate printers and scanners

as standalone devices, each with their own URL and distinct network identity. So instead of sending an engineer to monitor, program or enable a printer in Sydney, the HP boffins in Idaho can do it over the Web, directly from their desks, using smart embedded controllers and Java applets. And if they want to send images to a Web-enabled printer, they can be sent directly to the printer's own URL, which may then redirect, accept and store, or print them, or do anything else the receiver likes — without a PC in sight. According to HP's head of LaserJet Solutions, Lee Ray Massey, the idea of the snap-on network device isn't that far

old, is loaded with prepaid postal credits. The difference is this box is connected to the Internet. The device then sends any mail over the network to a receiving device nearest the actual destination, which then intelligently turns the network 'letter' into physical form and allows it to be delivered in the normal postal way. Again, no PCs around, just very smart peripherals.

All these moves are obviously designed to make the most possible use of the network, and to a large degree do away with the need for the computer that we use as the hub of our working practices. Embedded processors, custom

### There are other new technologies that you will have to know about apart from MMX and ordinary processors.

away. Just pop a box on the end of a cable, be it networked, on a phone line, or even at the end of a satellite link, and it will engage itself with the system, establish its own identity and do its own processing as and when required with nary a host PC within miles.

These two big printer companies are not alone in regarding the network as the driving force. Panasonic recently released the first ever Internet fax, which comes with its own built-in mini-server and URL. So once it's connected to any ISP, other Internet faxes can automatically recognise it and send messages over the Net in a completely transparent fashion as far as the user is concerned.

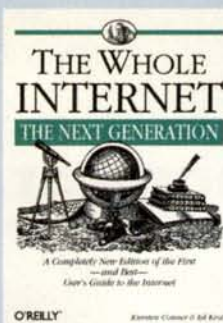
In a similar vein, Washington's postal service is now offering digital postage to its customers. A connected box sits on the E-Stamp user's desk, which, just like the franking machine of

operating systems and use-specific software will all become much more common as users realise that tinkering with Windows screensavers and desktops is actually just a complete (and totally avoidable) waste of time.

Could it be that peripheral hardware manufacturers are leaping at the chance to bring a truly open networking system to the world of computerised office productivity — one that is not shackled by a proprietary operating system?

Do you know what system your fax uses to communicate with another in Sweden? Nor me. But it works, and the idea of 'configuring' a fax or running 'programs' on one is laughable. It's use-specific, and it works. And unless I am much mistaken, we're just about to see the dawn of the use-specific intelligent network device. The only question is, who will control the software that runs the network . . . ?■

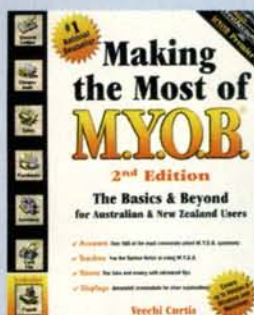




**The Whole Internet: The Next Generation**  
For Net surfers who have already mastered the basics and want to take the next leap into cyberspace. Shows you how to minimise junk mail, play online games, buy and sell on the Net and use the latest audio/video tools.

Not available until September.

\$54.95 PB

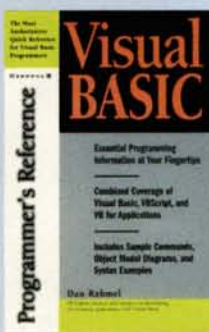


**Making the Most of M.Y.O.B. 2/e**  
The next cab off the rank for Australia's top accountancy software package. Covers Version 8,

the new multi-user version. Ideal for small businesses who want to make the most of their accounting power.

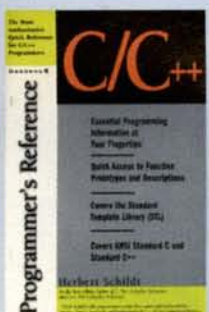
Sabrina,  
Wesley Professional & Technical, Perth

\$44.95 PB



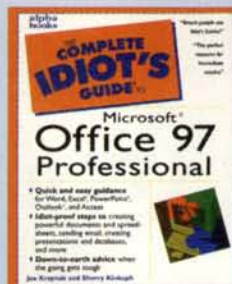
**Visual Basic Programmer's Reference**  
Whether you're developing full-blown applications or writing menu and tool-bar customising add-ins, this quick reference of precise programming syntax is extremely valuable for programmers at all levels.

\$34.95 PB



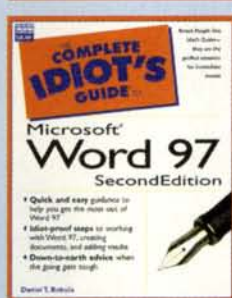
**C/C++ Programmer's Reference**  
This is one of those reference books that you'll wonder how you ever survived without. It provides quick, easy access to snap-shot explanations of the essential C/C++ programming syntax, keywords, commands, functions and class libraries.

\$34.95 PB



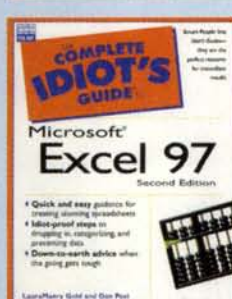
**Complete Idiot's Guide to Microsoft Office 97, 2/e**  
If you think you're in the 'all thumbs' category of computers, this book's for you. It tells you everything you need to know in plain English and makes it fun to learn. Especially helpful if you're a home/small office user.

\$34.95 PB



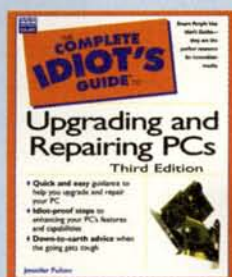
**Complete Idiot's Guide to Word 97, 2/e**  
The nice thing about Idiot's Guide is they talk to people who need a bit of a hand without being condescending. You'll find this one really easy to follow with heaps of helpful tips on word processing.

\$34.95 PB



**Complete Idiot's Guide to Microsoft Excel 97, 2/e**  
The non-intimidating approach to learning about Excel. This one includes coverage of the Microsoft Office Small Business Edition and how to use Excel with all Internet applications. Great for anyone new to the 97 version of the software.

\$34.95 PB



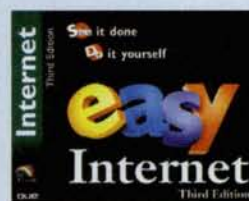
**Complete Idiot's Guide to Upgrading & Repairing PC's, 3/e**  
You'll learn how to upgrade your PC peripherals and increase productivity with this easy to follow, conversational guide. It approaches everything in a task oriented way. For example, "If you want to record your own CD".... then it takes you through the steps.

\$34.95 PB



**Sams Teach Yourself Windows 98 in 24 Hours**  
Another one in the bestselling Sams Teach Yourself in 24 Hours series. If you've already got Sams Teach Yourself Windows 98 in 24 Hours, this is perfect to get you beyond the basics...in just 24 hours.

\$34.95 PB



**Easy Internet, 3/e**  
The Internet is a wonderful tool...when you know how to use it. This book is for beginner surfers who want to get up to speed ASAP.

Its highly visual approach makes it easy to follow and won't overwhelm you with information overload. Highly recommended.

\$34.95 PB



**Easy PC's, 5/e**  
Learn how to master your PC with this four colour, easy to use visual guide. You'll quickly get the gist of things, including how to get the most

out of the latest version of Windows, basic software skills, multimedia features and the internet. Easy and fun.

\$34.95 PB



**Easy Word 97**  
The essential DIY approach to Word 97. Instead of bombarding you with loads of text, it shows you how to achieve results with graphics and

then gives you a go. You'll learn fast this way and gain a great sense of accomplishment.

\$34.95 PB



**Sams Teach Yourself Visual C++ 6 in 24 Hours**  
Today, a novice programmer...tomorrow, a C++ pro. This is the lowest priced C++ 6 tutorial available and it works just as well for existing programmers as it does for computer users new to programming.

\$34.95 PB

Phone 1800 805 711 during business hours for the location of your nearest Dymocks Bookstore, or order-on-line at [www.dymocks.com.au](http://www.dymocks.com.au).

All the Answers to your computer needs.



**DYMCKS**  
BOOKSELLERS

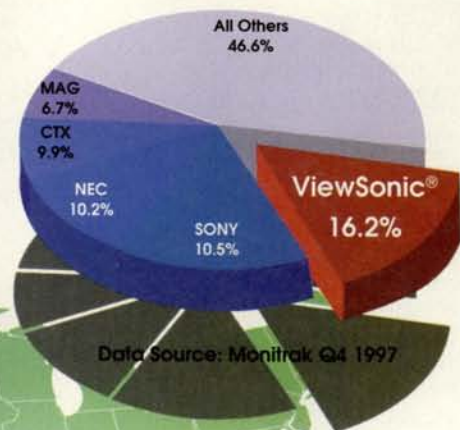


# Catch up the trend

# Take up ViewSonic® 17" quality monitor



**17-Inch stand-Alone Color Monitors  
Market Share in USA**



Are you still using 14" or 15" monitors? Have you got an idea that 17" monitors, with their bigger screen, better performance and affordable pricing, is now dominating the marketplace worldwide? ViewSonic® predicated this consumer trend even earlier and introduced an extensive line of unbeatable 17" quality monitors. And these monitors have won ViewSonic® numerous prestigious awards.

## # 1 in the 17-inch Market

For two consecutive years, ViewSonic® was rated the No. 1 best selling branded monitor in the 17" segment in the US, according to Monitraz reports. This extraordinary record speaks for itself why ViewSonic® is your obvious choice.

## Advanced Technology

ViewSonic® is always out in front with innovative technology. SuperClear™ technology gives you sharp text and bright vivid colors. SonicTron® set a new standard for aperture grille monitors in brightness, color saturation and screen

clarity. And Short Depth shortens the footprint of your monitor, giving back valuable desktop space, comfort and increased productivity.

## Award Winning Quality

ViewSonic is proud of the 180 editorial awards won in 1997 alone and 375 awards accumulated since its entry into the display market. A trophy case of proof that ViewSonic monitors offer unsurpassed quality at unbeatable prices. That's something smart users can not afford to miss.

Choose ViewSonic. And See the Difference!

Model	E771	G771	GA771	P775
CRT Size (viewable)	17" (16.0")	17" (16.0")	17" (16.0")	17" (16.0")
Dot Pitch	0.27mm	0.27mm	0.25mm	0.25mm
Max. Resolution	1280x1024	1280x1024	1280x1024	1600x1200
Recommended Resolution	1024x768 @ 87Hz	1024x768 @ 87Hz	1024x768 @ 87Hz	1600x1200 @ 76Hz
Horizontal Frequency(kHz)	30~70	30~70	30~70	30~95
Integrated Speakers			Yes	



**ViewSonic®**  
The Display Technology Company™

## Headquarters (U.S.A.):

Tel: 1-909-869-7976, Fax: 1-909-869-7958

## Asia Pacific Sales:

Tel: 886-2-2248-4072, Fax: 886-2-2240-8238

E-mail: vsi@viewsonic.com.tw

Website: www.viewsonic.com.

ViewSonic International has won ISO 9002 certification!

## Authorized Distributors:

Chips & Bits Tel: (02) 9680-9600, Tel: (03) 9696-1911,

Tel: (07) 3277-0599 Tel: (08) 8359-3555,

Tel: (08) 9228-0088

Tel: (08) 8362-9220

Microbits

Comdek

Tel: (08) 9324-3344

Daltron Electronics (Papua New Guinea) Tel: 675-3256766



*Despite the hype, DVD has been a long time coming.*

# DVD for your PC

**D**VD software and movie titles are finally filtering into the Australian market, but the range of PC DVD drives is still limited. APC reviewed four kits in April (see page 101) and since then the market players haven't changed. The good news is that prices for DVD drives continue to drop steadily.

The Creative PC-DVD Encore Dxr2 kit is by far the most popular, and most stores have them in stock. The kit includes a 2x PC DVD drive, a PCI-based Dxr2 card that decodes MPEG-2/Dolby Digital, all necessary cables, and a Creative sampler disc, which includes drivers and other utilities. Two DVD games — Wing Commander IV and Claw — are usually bundled with the kit (some stores offer Spycraft instead of Claw). In April the kit retailed at \$899. Just five months later Creative Pacific's recommended retail price is \$699; but you can pick up a kit for as little as \$499.

Dick Smith Electronics recently discounted the Creative PC-DVD Encore Dxr2 to \$499, \$100 less than its normal retail price. This was a sale offer for July but the retail chain told Price Watch it would continue to sell the product at \$499, which may signal a general trend to lower the price of the kit. Instead of the customary games titles, the retail chain bundles Adobe PhotoDeluxe and Xerox TextBridge Pro OCR scanning software with the kit.

DVD drives are also sold separately. Harris Technology was selling the Creative drive for \$338, but to be able to play DVD-Video and Dolby Digital Audio you will

need the Dxr2 board (which costs about \$290). A Cinemaster MPEG-2 decoder — a PCI-based DVD playback card — costs about \$300 when purchased separately.

Price Watch requested information about second-generation DVD drives, so all kits for which quotes were received were 2x DVD and 20x CD-ROM. The only retailers that supplied quotes on kits other than the Creative PC-DVD Encore Dxr2 were MVB Computer Supplies and Busi-Soft Computers. These stores provided quotes on a 'DVD Cinemaster kit', which included a Hitachi 2x DVD drive, a Cinemaster MPEG-2 decoder, and two DVD titles — Die Hard 3 and Muppet Treasure Island.

The DVD Vision II from Doiin was difficult to find. Price Watch resorted to contacting Samsung (the product's distributor) and was advised that consumers could purchase the kit through Harvey Norman and Retravisson stores. The sales assistants at both these stores could not provide Price Watch with a quote, claiming they did not stock the product. Samsung assured us the stores are suppliers and suggested we use the product code, DVD905/SAU, to order the product. We still had no luck, so if you really want a DVD Vision II it could prove difficult.

Buyers who have Net access have an advantage when choosing hardware in terms of getting more than the basic information a sales assistant can provide. Products can often be ordered in, so you don't have to restrict your choices to what's sit-



ting on shop shelves. Most larger stores have a Web site, which can give you information on the availability of products.

For an explanation of how DVD works, see Technobabble on page 140.■

## Our charter and method

Price Watch is an exercise in comparative technologies and relative prices. All investigations are conducted anonymously, and records are kept of conversations. Prices and system capabilities printed here are provided by the sales staff at the offices we contacted, and all information is as supplied. While we assume that these are correct, we cannot accept any responsibility for errors or omissions. Neither will we be held to account by companies mentioned here for omissions to product ranges or system capabilities. The responsibility rests with sales staff to provide adequate information, as the company would expect them to do with every customer.

## DVDs

Company	Contact	Product	Price
Adelaide Computer Centre	(08) 8212 2222	Creative PC-DVD Encore Dxr2	\$579
Busi-Soft Computers	(03) 9890 8900, <a href="http://www.busi-soft.com.au/">http://www.busi-soft.com.au/</a>	Creative PC-DVD Encore Dxr2; Hitachi 2x DVD-ROM drive, Cinemaster DVD PCI decoder card	\$599
Dick Smith Electronics	1300 366 644, <a href="http://www.dse.com.au/">http://www.dse.com.au/</a>	Creative PC-DVD Encore Dxr2	\$499
Harris Technology	(02) 9925 9925, <a href="http://www.ht.com.au/">http://www.ht.com.au/</a>	Creative PC-DVD Encore Dxr2	\$544
Headlam Computers and Software	(08) 9388 3666, <a href="http://www.headlam.com.au/">http://www.headlam.com.au/</a>	Creative PC-DVD Encore Dxr2	\$599
IT World	(02) 9647 1266	Creative PC-DVD Encore Dxr2	\$530
MVB Computer Supplies	(03) 9725 6255, <a href="http://www.burwood.starway.net.au/~mvb/">http://www.burwood.starway.net.au/~mvb/</a>	Hitachi 2x DVD-ROM drive, Cinemaster DVD PCI decoder card	\$599
PC Express	1300 364 567, <a href="http://www.pcexpress.com.au/">http://www.pcexpress.com.au/</a>	Creative PC-DVD Encore Dxr2	\$519



What are a consumer's rights when it comes to warranties and refunds? **By Roulla Yiaccoumi**

# Your basic rights

**Q**uestions about warranty win all popularity contests in letters to this column. Many of you want to know the answers to questions such as 'Do I have to return faulty goods in their original packaging to receive a refund?', 'Can the seller charge me for freight on faulty goods I am returning for a refund?' and 'Do I have to make a claim for a refund within a certain time frame?'.

All these questions and more are answered in the booklet *Warranties and Refunds*, published by the Australian Competition and Consumer Commission (ACCC). The ACCC is a federal, independent body which administers the Trade Practices and Price Surveillance Acts. Its jurisdiction also covers anticompetitive behaviour, unfair market practices, mergers and acquisitions of companies, and product safety and liability. (By the way, the answers to the above questions are all 'no'.)

## Warranties

If you open a product and find a written warranty card inside, this is known as the 'voluntary' or 'express' warranty. It is usually supplied by the manufacturer, but is sometimes provided by the retailer. The Trade Practices Act, however, gives automatic protection and certain warranty and refund rights to consumers, regardless of whether or not the retailer or manufacturer chooses to give its own voluntary warranty or guarantee. These are known as 'statutory' or 'implied' warranties.

Under the Trade Practices Act, statutory warranty rights cannot be limited by a seller or retailer. Retailers risk legal action or even prosecution for breaching the Trade Practices Act if they mislead customers. Consumers should be aware that goods bought at auction are not covered by any statutory warranties.

If you encounter problems with goods you have bought, the person or store that sold you those goods is responsible for fixing the problem. Do not be fobbed off by stores that tell you that you must contact the manufacturer.

## Refunds

According to the Trade Practices Act, if you are seeking a refund for faulty goods, a

claim must be made within a 'reasonable' time frame. The Act does not specify what 'reasonable' constitutes, but does go on to say that signs in stores that impose a time limit, for example 'No refunds after seven days' are illegal. Let us know if you see any stores using such signs.

So how do you know if goods you have bought can be returned for a refund?

Generally, there are four tests that can be applied to goods. The first is 'merchantable quality'. This means that the goods must meet a certain level of quality and performance relative to the price. For example, you may expect a \$1,500 PC to perform basic functions, but you'd expect a lot more from a \$4,000 machine. A loose screw in the back of the PC's case does not make it unmerchantable.

The second test is to ask yourself if the goods you bought were fit for the purpose you requested. For example, if you requested a powerful PC capable of processing intensive CAD applications but were sold a basic consumer PC, the goods sold to you clearly did not meet the criteria you set and are clearly not fit for the purpose. In cases such as this, according to the ACCC, consumers should be able to rely on advice from sales staff.

The third test is that goods must match the description or sample shown. If you were shown a particular keyboard and mouse which would ship with your PC, or were told a particular brand of hard drive would be included in your system, the seller must provide you with the sample shown. Ask the seller for a written quote with each component specified.

The last test is that the goods must be free from defects that will affect the merchantable quality of the goods. For example, a dent in the side of a PC case may earn you a few dollars off the purchase price, but it shouldn't affect the performance of the PC. Consumers cannot later complain about defects that were pointed out prior to purchase, but can complain if the defect has affected the merchantable quality.

Consumers should keep in mind that the law is designed to be fair to both consumers and sellers. If you aren't sure if your goods have faults that would entitle you to a refund, ask yourself the following questions: Did I follow the manufacturer's

instructions? Did I misuse or abuse the goods? (This includes accidental dropping.) Is the fault a major one, which affects the value of the goods? Did the performance of the product fall short of what I was led to believe?

If you return the goods to the store, it is your right to ask for one of the three Rs — refund, replacement or repair. This is the consumer's — not the seller's — choice. Remember, you cannot demand a refund if you simply change your mind about wanting the goods, saw the items cheaper in another store, or bought the goods as 'seconds'.

For more information or a copy of the booklet *Warranties and Refunds* contact your state ACCC office or check out the ACCC Web site at <http://www.accc.gov.au>. ■



CONSUMER

Tell us all about it

Service & Reliability is APC's consumer column. We invite you to send details of your buying experiences to:

**email** complaints@acp.com.au  
**fax** Service & Reliability at  
 (02) 9264 6320  
**mail** Service & Reliability,  
 Australian Personal  
 Computer, Level 8, 54 Park  
 St, Sydney NSW 1028.

Please keep your letters to no more than 300 words. All letters must contain a full name, address and contact phone number.

APC reserves the right to edit any submitted material for length and clarity.

We can publish only a selection of letters each month and regret that letters cannot be answered personally. Please note that issues in this column are discussed in relation to federal consumer laws, and readers should contact their respective state consumer affairs or fair trading department for relevant local information.



# HEAVYWEIGHT DESKTOP. LIGHTWEIGHT PRICE.



## DELL DIMENSION® XPS R400

- Intel® Pentium® II Processor 400MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- **NEW 8MB AGP Video Card**
- Turtle Beach Montego A3D64 Voice PCI Sound Card
- **NEW 40X Variable EIDE CD-ROM Drive**
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 56K Capable U.S. Robotics X2 WinModem
- Telstra Big Pond Internet Starter Kit with 50 hours free Internet access\*
- 3 year limited warranty

**\$3,669\***

or \$32 per week\*\*

Upgrade options: 17" Trinitron® Monitor (16.0" v.i.s.) \$461, Iomega Zip 100MB Internal Drive \$188

## DELL DIMENSION® XPS R350

- Intel® Pentium® II Processor 350MHz
- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- **NEW 8MB AGP Video Card**
- Turtle Beach Montego A3D64 Voice PCI Sound Card
- **NEW 40X Variable EIDE CD-ROM Drive**
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 56K Capable U.S. Robotics X2 WinModem
- Telstra Big Pond Internet Starter Kit with 50 hours free Internet access\*
- 3 year limited warranty

**\$3,279\***

or \$28 per week\*\*

Upgrade options: 19" Colour Monitor (17.9" v.i.s.) \$461, Altec Lansing ACS-495 Full Dolby® Surround Sound Speakers with Subwoofer \$216

## DELL'S WIRED!

You can custom-configure Dell PCs to your exact requirements with the latest technology at great-value prices – even order and make payment via our credit card secure WebStore! It's open 24 hours a day, so try it for yourself. We are constantly revising our prices and offering new products. Call today or visit our Web site for our latest product and price offers.

Visit [www.dell.com.au](http://www.dell.com.au)

## CALL DELL

Call Dell today, Mon-Fri 8am-8pm, Sat 9am-3pm (EST).

**DELL®**



**1300 303 172**

OR VISIT [www.dell.com.au](http://www.dell.com.au)

\*Prices and specifications subject to change without notice. All prices shown include tax and delivery is additional. Certain configurations can not be changed. Dell, the Dell logo and Dell Dimension, are registered trademarks of the Dell Computer Corporation. The Intel inside logo and Pentium are registered trademarks of Intel Corporation. Microsoft, Windows 98 are registered trademarks of Microsoft Corporation. Other trademarks and trade names may be used in this document, refer to either the entities claiming marks and names or their products. Dell disclaims proprietary interest in the marks and the names of others. Dell is not responsible for errors in typography and photography. Photographed with options. For a complete copy of Dell's limited warranty offerings please write to Dell Computer Pty Ltd, Building 3, 14 Aquatic Drive, Frenchs Forest, NSW, 2086. \*\*Dell Financial Services offer rentals based on a 36 month term excluding stamp duty and FID which varies from state to state. Rentals and operating leases are available only to approved registered sole traders, partnerships and companies. Figures shown are indicative and may vary with interest rates. \*You'll need a valid credit card to access. 50 free hours must be used within the first month of registration. Normal Telstra charges apply. Copyright 1998 Dell Computer Corporation. All Rights reserved. DEL00032/APC/DM/2



*Why are some small enterprises jamming  
into online shopping malls?*

## What's in a name?

**G**iven the ubiquity of the suburban shopping mall in the collective global consciousness, it is no surprise that many Internet merchants are using the mall model for their online ventures. Several major Australian online malls have been launched in the past year, and smaller Australian businesses can reap particular benefits by taking part in the migration of bricks-and-mortar shopping into cyberspace.

While analysts predict a potential Internet shopping market worth hundreds of billions of dollars, their estimates vary so widely that it is perhaps more useful to simply say that the Internet is the most significant new marketing channel to come along in years.

Getting onto the information superhighway, however, can easily rise out of the reach of all but the most cash-rich companies. While secure Web server and transaction processing software is becoming cheaper and more powerful with every release, ancillary costs — Web page design and consulting, systems implementation, site hosting and the like — quickly add up. Then, of course, there's the even more difficult task of marketing the site — placing costly advertising on related sites, seeding the URL in popular search engines, and so on.

Considering that such a large investment in time and money won't reap significant returns for some time yet, online shopping malls are becoming appealing to small businesses. Economies of scale mean small and medium businesses can join an online mall for much less money and effort than it would take to build and run their own site. These days, you can take your pick: the Advance Bank, Yellow Pages, Oz Mall, Sofcom, AltaVista and many other Australian sites all allow companies to set up online.

Melbourne CBD camera specialist Camera Action Camera House set up a Web site in April 1996, from which it advertised its products and let interested Web surfers enquire about products, place special orders and arrange to place orders — which were completed via fax.

Managing director Sina Clayton began thinking about getting more serious about online sales after seeing TV advertisements for Telstra's new SureLink service earlier this year. She tried out



SureLink by buying several CDs from founding SureLink member JB Hi-Fi, and was impressed enough that by March she had decided to get onboard. By June, Camera Action Camera House had become a featured tenant at the Telstra SureLink mall.

Clayton said it is valuable to be able to link the company's Web site with a well-recognised name such as Telstra. "A lot of people are a bit dubious about being online," she explained, "but there are a lot of people who feel [comfortable with] Telstra as an organisation. [Signing up with Telstra] gives many people confidence that they wouldn't get by going through a third-party company that they don't know."

### Cash poor, image rich

Indeed, brand recognition may be the most valuable reason for small businesses to open up shop in an online mall. Counting on this fact, major retail brand name Visa recently teamed up with one of the best-known names on the Web — Yahoo — to develop the Visa Shopping Guide (VSG) (<http://shopguide.yahoo.com.au>). The VSG organises over 177 online vendors — all of whom are either Australian or ship to Australia — into 22 different categories.

Despite the involvement of Visa, the site does not yet support transactions using the SET (Secure Electronic Transaction) standard which Visa co-developed — although Greg Storey, head of VisaNet

with Visa International Australia and New Zealand, said a Visa SET Shopping Guide is in the wings. Instead, Visa's role is largely an advisory one — offering information about topics such as credit-card security on the Web.

Still, Storey said, Visa's involvement in the VSG lends an additional air of credibility to the site, the value of which should not be underestimated. "Visa is very relevant to over 7 million consumers in Australia today," he explained. "I truly believe we have a responsibility to have a role on the Web, and we want to help facilitate the linkage between the cardholder and merchant. [By being involved in the Visa Shopping Guide] Visa is a party to a very evolving ecommerce and shopping environment."

For Luke Mahony, director of Newcastle-based online liquor retailer Liquorlink, the ability to leverage the well-known Yahoo brand name was enough to justify advertising on the Visa Shopping Guide despite the store's minimal advertising budget. "We haven't got money to throw around and I've never been a fan of online shopping malls in the past," he said. "However, Yahoo has a pretty dominant position in the [Web] market, and people coming to the Shopping Guide already have shopping on their mind. We're also listed with the AltaVista Shopping Guide, but it's not returning as many hits as the Visa Shopping Guide is. Even better, it's only going to get more popular with newbies [many of whom know the name Yahoo]."

Even major retailers are taking advantage of the Visa and Yahoo brand names. Bookseller Angus & Robertson Bookworld, for example, set up shop on Telstra SureLink some time ago but now also advertises its site on the Visa Shopping Guide. "Customers like to feel safe, and because there are so many [online merchants] people are very wary about where they go," explained advertising manager Carol Marsden. "A lot of people don't know we're on the Web, but something like the Visa Shopping Guide is interesting to people who are just learning [about online shopping]. We think it will be a good avenue for us to attract new customers to our site."

**David Braue**



***While the  
new Fujitsu  
is projecting  
a big, bright  
image...***



**TRUE  
XGA**

***...it's also  
projecting  
your  
image  
as well.***

When you project your presentation through the all new, light weight Fujitsu Liquid Crystal Display Projector, it not only projects a big, bright, high quality picture – it also shows that you and your company know state of the art technology.

The Fujitsu LCD Projector has high brightness (650 ANSI Lumens) and features a remote control, remote mouse & laser pointer all in one.

Talk to your Fujitsu distributor – you'll see why the new light weight (6.8kg) Fujitsu LCD Projector is a brilliant way to project your image.

**FUJITSU**

***Bright ideas for the new Millennium***

Fujitsu General (Aust.) Pty Limited.

NSW (02) 9860 0222 • VIC/TAS (03) 9510 8652


QLD (07) 3367 2008 • SA/NT (08) 8364 0588 • WA (08) 9345 2011

E-mail: [contact@fujitsugeneral.com.au](mailto:contact@fujitsugeneral.com.au) • [www.fujitsugeneral.com.au](http://www.fujitsugeneral.com.au)



*Just how deeply can you embed  
IT in education?*

# Building on solid foundations

 n leave of absence from his position as principal at River Oaks School in Ontario, Canada, Gerry Smith has been passing on his experience in curriculum and IT in a series of seminars for Australian teachers and principals.

River Oaks is a kindergarten to grade 8 public school which opened in 1990 with the aim of restructuring the curriculum to provide students with an education that equips them for the 21st century. Smith says IT has become "almost transparent in the teaching and learning process".

Genuine learning requires integration, so River Oaks has dropped the focus on traditional subjects in favour of Human Relationships, Science and Technology and Global Awareness. "When confronted with a problem, you don't ask which part of it is science, which part is history, and so on, you draw on or seek knowledge and skills from any and all areas," Smith said.

Within these areas, the framework for learning covers conceptual development (such as change, patterns, relationships and systems), communication architecture (oral and written language, number, interactive media and interpersonal skills), and behaviour (attitudes, feelings and beliefs). As far as possible, these matters are addressed within integrated units of study such as 'Community Helpers', 'Down Under — The Uniqueness of Australia' and 'Robotics'.

This structure is still under review, and may be replaced with Physical, Human and Digital curricula, with the framework for learning comprising intellectual capacity (knowledge and its application), communication (text, oral work, music, and numbers) and culture (such as customs and norms).

Smith quoted US statistics showing that the only industry sector providing employment growth is information and communication — even service positions peaked in 1990. Furthermore, nine out of the 10 fastest growing job fields require an understanding of maths and science.

His argument that curriculum restructuring must precede the introduction of IT matches commercial experience: rather than computerising a manual process, you should take the opportunity to see if you're really doing the right things.



Computer use is embedded within the school day from kindergarten, but the younger children spend plenty of time with pencil and paper and concrete materials. In grades 7 and 8, there is approximately one computer per two students. While a lab provides a way of kick-starting computer literacy, Smith believes "the placement of computers in the classroom is . . . the only way to go". The focus is on the use of tools in activities involving critical thinking and exploration and discovery, not on drill and practice or the consumption of multimedia.

But how do these new activities (and their implications for staff development) fit into time and resource constraints?

Email has had "a profound impact on how we operate," Smith said. By taking information dissemination out of faculty meetings, they could be reduced from 20 to three per year. The remaining 17 — the teachers' industrial agreement specifies 20 after-school meetings — have been turned into training sessions. Training is backed by a system of peer coaching. Some teachers have time-release for the purpose, others volunteer. According to Smith, coaching massively boosts skills transfer as it enables teachers to quickly and easily overcome any problems they encounter when first applying what they have learned.

Other time savers include preparing school reports using a computer (around 20 hours), keeping a teacher and class together for two years instead of one

(around two weeks per year), doing as much teaching as possible in one place (up to one full traditional lesson per day) and innovative timetabling such as teaching 'vocal music' to an entire year at a time (freeing other teachers) and extending timetable blocks to 90 minutes. This last idea not only reduces the time wasted between blocks, it also reduces the tendency to present students with "an endless array of facts and skills that are unconnected, fragmented and disjointed," said Smith. A change in pedagogy is necessary to hold students' interest for these longer periods.

It's not only time that is in short supply; River Oaks operates on the same budget as other schools in the district, but spends between 65% and 70% of its global budget on IT. These funds have been freed in various ways, including the use of electronic rather than paper resources in the classroom (textbooks are only used for maths; traditional encyclopedias are replaced by CD-ROM editions) and virtually abolishing photocopying. The school still buys lots of literature, but links reading materials to the integrated units.

Textbooks are largely replaced by the Web — the librarian provides teachers with a list of eight or nine carefully selected bookmarks for each unit. This avoids using out-of-date textbooks, but Smith warned that it's essential to have someone who can locate the right sites. Internet access is cheap for River Oaks: the 128K ISDN connection to York University costs a flat 78 cents per month.

Computers also have a major role in the music program. There's a computer-based recording studio, and MIDI wind instruments and drum pads provide a 'hook' into learning traditional instruments. River Oaks' budget doesn't extend to a band, but its former students dominate the local high school band.

Technical problems are few and far between. The school's collection of Macintoshes of different vintages have proved very reliable. When trouble does strike, a teacher and coach will only spend a few minutes trying to correct it before the machine is sent to the school district's technical staff for attention.

**Stephen Withers**



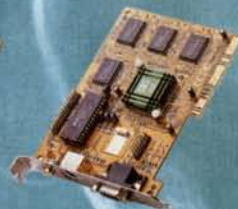
# Total Component Solutions



AOpen AX6B Motherboard



AOpen 36x CD-Rom



AOpen PA50 2x AGP Card



AOpen AW35 Sound Card



AOpen HX45 Midi-Tower

**"...it's a dream board for performance enthusiasts."**

apc mag -  
BX Motherboard test  
July '98

**"...the best BX board on test."**

**"...a solid inclusion in any high performance system."**

PC @authority -  
Motherboard test  
feature June '98

In line with its commitment to be the first with the latest, AOpen is proud to present the new AX6B motherboard with the latest Intel 82440BX chipset.

This state-of-the-art motherboard incorporates unique and advanced features such as bus speed up to 133MHz\* which is guaranteed to increase efficiency and maximise PC performance.

The AOpen AX6B motherboard is a multi-award winner and has received overall recommendation for compatibility and stability from Toms Hardware and a best overall BX motherboard performance award from Anandtech.

AOpen provides total component solutions for all users. Incompatibility issues have been solved by us prior to the shipment of goods, and the AX6B motherboard is supplied with a 2 year warranty, therefore you are guaranteed peace of mind.

For more information on the new AX6B motherboard and comprehensive AOpen product range, please visit our web site at: <http://www.servex.com.au>.

Local enquiries may be made on (02) 9870 1936 or sent by email to: [ddeng@acer.com.au](mailto:ddeng@acer.com.au) or you may wish to contact any of our distributors below:



Winner July '98



Winner June '98

NSW: Advanced Customised Computers (02) 9692 9988 • Best Byte (02) 9436 0788 • SCS (02) 9831 2525  
ACT: The Logical Approach (02) 6251 6511 VIC: CANDA (03) 9574 9760 • Omega Computers (03) 9800 3444  
QLD: Compuworld (07) 3846 7588 • Intermedia (07) 3369 0477  
SA: Binary Logic (08) 8342 0022 • Crest (08) 8299 0088 WA: Direct Memory Access (08) 9443 9322

\* Details on web site

**AOpen**  
Servex Australia Pty Ltd  
Exclusive Distributor

IDCAOpen/AX6B/July'98



# The New Force in PC Audio

# WAVEFORCE

## XG PCI SOUND CARD

from **YAMAHA**

AVAILABLE  
NOW!  
ONLY \$189

The Yamaha WAVEFORCE WF-192XG is a breakthrough XG PCI Sound Card giving you the best sound generation technology available at an unbelievably low price.

### • FOR MUSIC AND GAMES

- 932 voices
- 21 drum kits
- 52 effects settings
- 2 sound synthesizers (64 notes polyphony)

### • XG - PERFORMANCE & FLEXIBILITY

- Yamaha's revolutionary Extended General Midi is fully compatible with, but better than, General Midi

### • AUDIO QUALITY

- PCI Bus architecture and AC97 design standard means better sound on your PC

### • GAMES COMPATIBILITY

- Sound Blaster Pro (Windows DOS Box)
- Microsoft Direct Sound
- Microsoft Direct Sound 3D

### • PACKAGED WITH POWERFUL SOFTWARE

- XG Works Lite - 100 track sequencer with editing and scoring features
- Over 100 Midi files
- Multimedia player
- Soft synthesizer with hundreds of high-quality PCM & Wavetable sounds
- Mid Plug & SoundVQ - powerful internet & m'media plug-in tools
- Wave Editor - record, edit & play WAV files



WINNER - PC PowerPlay  
HOT HARDWARE AWARD  
August 1998 Edition



WINNER - PC Magazine  
EDITORS' CHOICE AWARD  
July 1998 Edition

These Award-Winning Sound Cards  
are available now from:

Guardian Data Pty Ltd

Toll Free: 1 800 153 553

Peripheral Sources International Pty Ltd

Telephone: 03 9878 8611

Synnex Australia Pty Ltd

Toll Free: 1 300 651 665

And all leading computer and  
music retailers.

GENERAL  
MIDI

**XG**



SONDIUS-XG



**YAMAHA**

MUSIC AUSTRALIA PTY LTD

A.C.N.004 259 527

PHONE: 1800 805 413



# Wanted!

*We know what we want:  
more IT staff; but how  
do we get them?*

**By Selina Mitchell**

A woman goes into a shop to buy an IT monkey. She asks the owner about the cute, brown, furry one sitting quietly. "He's \$150," said the owner, "he programs in C."

"What about that one over there?" she asks, pointing to another similar-looking monkey.

"Oh, he's very popular, he programs in C++. He's \$500."

She then points to a scrawny monkey tucked away in the corner of the room.

"How much is that one?"

"Oh, he's \$10,000. He's a contractor."

It would be funny if the situation wasn't so serious. While more companies are relying on IT to provide them with a competitive advantage, the number of experienced workers available to fill IT roles is in rapid decline. Some employees are already being

paid ludicrous amounts of money to provide basic but crucial IT skills to companies and government agencies, and as the supply of skilled workers dries up, the salaries creep up.

Most companies are constantly in hiring mode. Their tactics include making outsourcing arrangements to transfer the burden, making deals to take graduates from particular courses, posting permanent notices on Web sites inviting job applicants, and keeping open books with recruitment companies. Some companies use all of the above strategies.

Despite the lucrative rewards of IT work, and a high rate of unemployment in many other fields, nowhere near enough students are entering the industry. The finite number of graduates are soaked up like a sponge even before they finish their courses, said one frustrated recruiter. Another recruitment company recently received a request for 121 programmers. "We will be lucky to find them three!" said a spokesperson.

The Federal Government rhetoric on IT as economic saviour is well noted; however, so too is the industry view that these words have not been followed with action. The Government points to high economic growth in the US through IT development as its example of success, but according to a recent Gartner Group report, *Australia's IT&T Future*, it has not acknowledged that Australia doesn't have the workers it needs to fulfil the dream here.

The Australian Information Industry Association (AIIA) suggests demand for IT workers is rising 8% to 12% annually. It is attempting to gauge the size of the shortage to better lobby government for more university places and press home to businesses the need for constant reskilling, said spokesperson Michel Hedley.

This is not just an Australian but a global problem. In the US there are about 350,000 IT positions that remain unfilled. The Information Technology Association of America (ITAA) has described the situation as a national crisis. Research firm





## Tickling the fancy

Some companies are going to extraordinary lengths to hold onto their staff. *Fortune* magazine recently surveyed US workers to find the most popular places to work. Most that did well offered workers salary and stock options, but also fun and personal extras, such as massages and laundry services. Many companies are also giving staff the opportunity to bring their pets to work with them.

APC found no services of this nature in Australia, but smart companies are becoming more flexible, offering bonus family holidays, the option of working at home and flexible working hours.

Morgan & Banks' Rawlinson also stressed the importance for an organisation to become an employer of choice. "You want to be a firm that people want to work for, and that involves having a good team, good products and services." Some companies, such as Hewlett-Packard, have job offers snapped up because it looks good on a CV and is known as a great place to work, he said. Other companies have tarnished their reputation through such things as buggy products, poorly handled dismissals or badly managed projects, Rawlinson added, so people don't want to work there.

META Group estimated that the labour shortage will cost US industry \$US500 billion in business revenue, \$US10 billion in business income and \$US15 billion in increased compensation costs.

As the global pool dwindles, and more demand is placed on it, the search for staff will get dirty, recruiters warn. The situation will become acute in the next two years, as demand is projected to increase by at least 100% and the average length of employee retention drops below its current average of less than one year.

"There is a huge imbalance in the demand and supply for staff with IT skills and it's only going to get worse in the short term," said John Rawlinson, director of Morgan & Banks in Melbourne. "Everyone is looking globally for recruitment, and this will cause problems for Australia, especially since the exchange rate in Australia is so low. It makes work in the US and the UK look good."

Computer Power trains 30,000 people per year and the number is increasing. Employers use training not only to keep staff up-to-date with new technology, but also to entice them to stay. The number of students being trained by Computer Power has increased 20% in the past 12 months. In the past, 95% of Computer Power graduates would get a job in three months. Now it is just three to four weeks, said Computer Power Education managing director Dr Beng Yeoh.

Despite falling industry and consumer confidence in the national economy and declining job expectations, there is still growth in the IT&T jobs sector. The Morgan & Banks Job Index for May to July 1998 indicates that the information technology sector was again the most consistent growth industry. More than half of

the organisations surveyed anticipated hiring staff.

The Drake International Employment Forecast predicted the IT&T sector would lead jobs creation in the next quarter, its staffing levels are set to increase by 2.6% nationally. Up to 28% of firms are in hiring mode. "While Olympics-related activity is having a positive effect on the industry in NSW, an escalation in electronic business and Web site installations, year 2000 modifications and ongoing hardware and software upgrades is proving a boost to the industry nationwide," said spokesperson John Troughton. Demand for Web site generation, electronic business and smart card developments were included in many organisations' budgets for the 1998/99 financial year, he said.

There seem to be similar elements to the skills shortage worldwide, said Kerriann Vogel, META Group's head of IT and human resources research. In the US, the number of computing graduates has decreased 40% over the past 10 years, she said. "Fewer and fewer people are coming in at the lower end to fill the gaps. It is a tough course at college, and it is hard to maintain a high grade point average."

In Australia, the number of graduates nowhere near meets demand. Computer 2000 managing director Angela Bays said many people left the industry during the recession and there was no incentive for graduates to study in the area.

The shortage has been exacerbated by Y2K. "Most people on staff with any Cobol experience have been put onto Y2K projects," said Vogel. "The only way to meet

the deadline is to throw more people at the problem, but they have to be taken off other projects." The introduction of the new euro currency across Europe is expected to cause another drain on resources, as will any changes to the taxation system in Australia.

Constant reinvention and innovation within the IT industry itself is also to blame, said Steve Ross, general manager for Com Tech Educational Services. "Vendors are constantly bringing out new versions of hardware and software products," he said. "More skills are needed to manage the ever-changing functionality."

Rawlinson noted: "The market's acceptance of new technology far outruns the support available for that technology. As the markets embrace it, there is a lag in those trained up to fulfil the need."

## Coming to take you away

An IT analyst was sitting on a plane returning to Sydney after a recent trip to the US. He started a conversation with a neighbouring passenger, who happened to work in a related field, about the skills shortage. An American in the seat behind joined the con-



versation: "Funny you should mention that. I'm a recruiter coming to interview workers". Then the person sitting next to the revealed headhunter said, "Hey, so am I."

Australia is a hunting ground for overseas markets. Recruiters fly in and interview scores of potential candidates at a time. One UK company is reported to be spending \$1 million to set up offices in Australia to fill about 80 vacancies.



SONY

A computer monitor so advanced it even  
corrects the earth's magnetic field.



PLATINUM  
SERIES

When Sony's engineers, being the fastidious people they are, discovered that seemingly unrelated things like the earth's magnetic field could distort a monitor's picture, they promptly invented a way to correct it. They also invented a way to correct distortion caused by fluctuations in temperature, and a unique feature called Digital Multiscan II, which continually assesses and sharpens a screen's image. All this, combined with Sony's applauded Trinitron technology, will give you the ultimate tool for improving your company's image. For a brochure call 1800 226 429. **It's a Sony**



## What's hot

You could be mistaken for thinking a skilled IT worker would never be jobless. Morgan & Banks alone places 20 to 40 people in contract positions and 20-plus people in permanent positions every week. Most IT skills are in high demand, but some are more sought after than others. Project managers are highly prized, for instance.

There are between 350,000 and 450,000 people employed in this sector in Australia, and it's growing, said the ALIA's manager of education and training, Michel Hedley. "It is ironic that we have over 8% unemployment, while the IT industry is screaming for people," he said.

SAP skills are probably most in need. Gap IT Consulting has five staff dedicated to finding people with SAP skills. PeopleSoft, Baan and Oracle skills are also highly rewarded with 25% premiums.

Expertise in AS/400, PowerBuilder, Unix, C++ and Java are all in demand, as are people with all-important Cobol skills.

Those states with the highest rate of expected employment growth, according to the latest Morgan & Banks Job Index, are South Australia, Victoria and Western Australia.

There is a very high demand for Australian workers, said Rawlinson. "Australia has a good take-up of technology, people are skilled in all areas of demand, and Australians are said to fit in well in most cultures and work environments, and are recognised as being good at software development." Unlike doctors or lawyers, IT workers can easily transfer skills to other countries, starting work straight away without transitional study or testing.

Australians are lining up to go overseas. A recruiter with clients in the US, UK and the Middle East said she speaks to eight to 10 people per day who have visas or tickets and are ready to leave. "Companies in Australia can't compete," said Bays. "In the UK a bog standard analyst/programmer will get £2,000 per week. And they have a tax rate of 25%. Contractors here can't earn anywhere near that much." Computer 2000, like many other firms, has much more success with overseas placements than with finding workers for Australian positions.

According to the Gartner report, the average annual net income of an engineer in Sydney is \$US27,200, compared with \$US45,000 in Los Angeles. IT&T professionals with skills in hot areas such as Java, SAP implementation or year 2000 project management can command salaries in the US almost double the Australian rate (and pay less tax), it states.

US-based Anzus Technology finds Australian and New Zealand staff for US clients, depending on its Web site and local associates to gather staff. It does not have to entice people, they want to come, said managing director Patricia Stander. "They want to sharpen their skills, see a new part of the world, and generally earn more money," she said.

Even national governments are targeting Australian workers. The Singapore Government's Manpower Ministry has launched a 'Contact Singapore' project, with \$US45 million in funding to help attract IT&T talent from Australia, the US, Canada and the UK, said the Gartner report.

Most overseas placements are to the US and the UK, said recruitment agencies. The Middle East and South Africa are also increasingly pressing for workers, however. The US is probably the most frequent advertiser, as well as the most popular destination. Competition is increasing — companies are already searching for workers to start in early 1999. One expatriate Australian working in Seattle said many of the companies pay their own staff a bonus if they bring in potential employees.

This is a worker's market, and workers, it seems, prefer to work not only in particular countries, but also on contract, and for particular types of companies. The IT market has long had a high volume of contractors. Contract workers make more money and contract terms were once popular in the industry: a lot of IT work is project based, and companies need people with certain skills for a specific amount of time only, said Rawlinson.

"We can't find all the people to fill the permanent positions here," said Bays. "People want to work on a contract basis because it's more lucrative."

In the US, companies are beginning to revolt, said Stander. "The contract demand seems to have peaked some months ago and now the primary demand is for permanent employees. A non-US-citizen candidate should be prepared to take a permanent position and perhaps stay a little longer."

The IT brain drain is impacting all organisations, but some are finding it harder than others to attract workers. The skills shortage is most notable among non-IT vendors. In the US, companies implementing IT systems had 217,000 openings at last ITAA count, while IT vendors had 130,000 technical openings.

"Technical vendors can guarantee training and work with cutting-edge technology," said Vogel. "That's impressive on the résumé. User organisations buy technology and keep it for a couple of years. That's not."

She said in the US, government agencies are at greater disadvantage. There isn't the money to pay competitive



Kerriann Vogel, META Group's head of IT and human resources research.

salaries, and the practice of rewarding the longest serving rather than the most knowledgeable is a disincentive for young stars. "The top 25% of the IT market will double their salaries by going to the private sector." A similar situation exists in Australia, recruiters told APC.

Even recruitment companies find it hard to get the people that they need. "Generally IT people want to work for an IT company," said Rawlinson. "If you are in the Morgan & Banks IT department you are not really in the main game. Our main function is placing people. If you are in a company that, for example, out-sources IT there is much more scope. You get to work on interesting, state-of-the-art projects with constantly updated technology."

Private training companies, such as Computer Power, are also finding it hard to recruit and retain trainers, and they



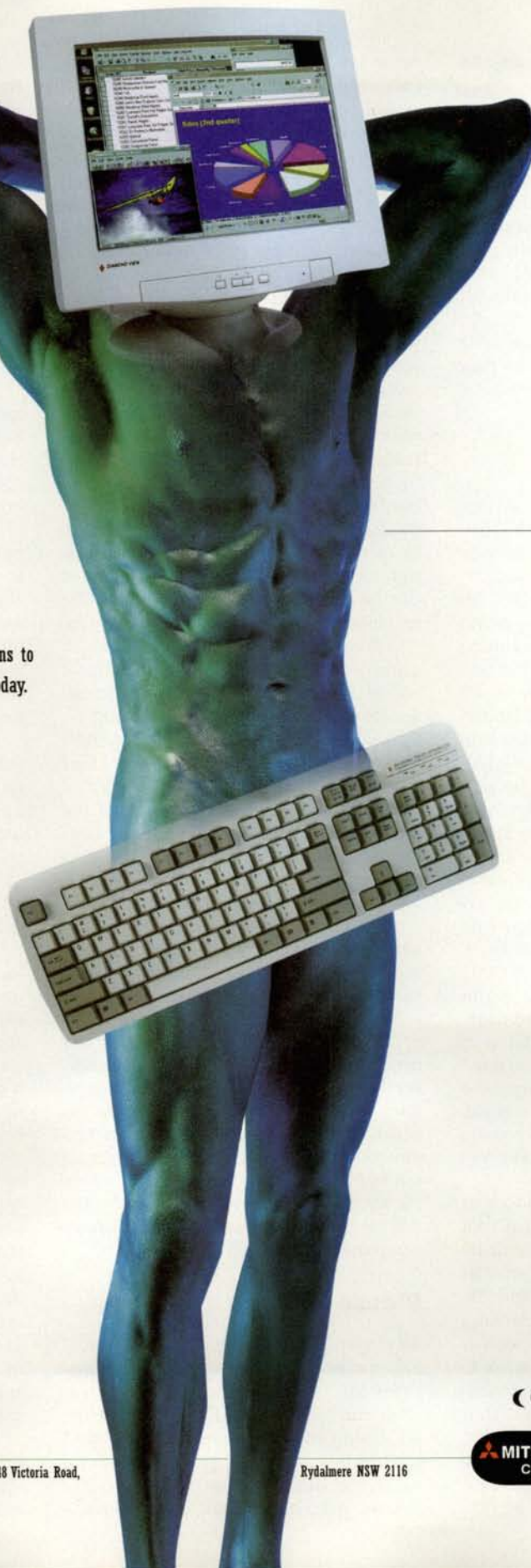
**( Strength )**

**Pushing the  
envelope.**

One company has the  
**STRENGTH** to do this and the  
**courage** to be better; —  
to provide an exceptional range of  
technically advanced solutions to  
business solutions beyond today.

The company is  
**Mitsubishi Electric  
Australia**

Their philosophy of  
**Quality,**  
**Versatility** and  
**Competitive Solutions**  
continues to drive  
their **BELIEF** beyond  
boundaries.



**Monitors**

DIAMONDTRON® 17" 67TXV  
DIAMONDTRON® 21" 91TXM

Diamond View:  
15" (1554)  
15" (1569i) with OSD  
17" (1772e) with OSD

♦ TFT LCD Monitor  
15" (LXA520W)

**Plasma**

40" Plasma display panel

**CD Roms**

Diamond Data:  
24X (624A)  
32X (632A)  
CD ReWriter (CDRW)

**( Courage )**

**Floppy Disc Drive**

1.44 (MF355F - 3250MG)  
120M SuperDisk™

**Modems**

Diamond Voice:  
56k (Internal)  
56k (External)

**Keyboards**

Diamond Touch:  
♦ Windows (6511PX)  
Ergonomic palm rest (6511HW)

♦ Products shown

**( Belief )**

For information about  
our excellent products, phone

**( 02 - 9684 7777 )**



often end up employing past graduates for the positions, said Yeoh.

University lecturers are not impressed either. They see their past students in their first jobs earning more than they do. The enterprise-wide software course is probably the most popular IT course at the Queensland University of Technology (QUT). There are enormous employment prospects, said course coordinator and assistant dean of postgraduate studies for QUT Information Technology, Bob Smyth. "Some of the lecturing staff continue to be amazed at the number of students they teach and then see off earning two to three times as much money as they do."

### Come on down

The flood of IT staff leaving to take up jobs in the US may have been curtailed, albeit temporarily. By July, the US had already issued its quota of H1B visas up until October. Unless the quota is extended by Congress, visas will not be available again until at least then. Australians planning to leave are at worst postponing plans, and those wishing to find work in the US from other countries are looking for alternatives, including Australia. The Asian economic crisis is also aiding Australia's situation as workers there search for new opportunities. Planes may be flying in overseas IT poachers, but they also fly out Australian recruiters. There are mixed views, however, on Australia's present ability to attract workers here. Some say that despite the poor exchange rate and lower wages, we are still a popular destination.

Morgan & Banks is still bringing in many people from the UK, said Rawlinson. The company is undertaking interviews for workers right now. The attraction is not so much the money as the lifestyle, he said. "It's summer in the UK and it is still raining. We run ads with people running on the beach. They see a couple of years in Australia as a holiday."

Richard Harris, general manager of Icon NSW, said it was defeatist to say that overseas workers won't come here because the wages are too low. Icon has staff in Hong Kong, Singapore, Taiwan, the UK, US, Canada, and South Africa seeking candidates. It also has teams dedicated to particular clients who travel overseas to physically recruit. "They sell the Australian lifestyle very strongly, and that way they negate any salary differentials." They go over armed with grocery dockets, information on taxation, Medicare and finances, and with a promise of pre-

arranged accommodation as well as a fridge full of food, he said.

Still, the competition is tough, and Gartner Group believes it is time to make employment with locally owned companies more attractive for the often young and highly mobile IT workers. "This can only be done by offering incentive schemes involving stock and equity," it said in *Australia's IT&T Future*.

"Australia should at least consider a review of the immigration points system, with more emphasis on IT&T experience, judged by qualified people, rather than relying so much on factors such as age, degrees, family ties, wealth and business plans," said the report. "Under current rules, Bill Gates would not qualify for entry to Australia as an immigrant, since he holds no formal qualifications in IT&T. Bureaucrats should not make the decision as to who is IT&T qualified. Either Australia takes a totally open approach, or the decisions should be made by the employers prepared to actually hire them."

"There is an option that Australia could leverage if there was the political will to do so — a massive influx of immigrants with IT&T skills. The US — Silicon Valley in particular — attracts the world's best and brightest. One out of every four people with a science degree in the United States is an immigrant, and most of the 6,000 IT&T companies in Northern California have at least one immigrant as a founder."

"Perhaps it is time for Australia to launch a new £10 migrant campaign, targeting the global IT&T professional, just as Australia encouraged workers to come to Australia through the government £10 subsidised migrant program of the 1950s."

The Gartner report also stresses the need to bring back those Australian workers that have already left to find employment overseas. It notes that in the past two years, the Taiwanese government has managed to convince over 400 PhDs to return to Taiwan from the US. "Those people have been largely responsible for the extraordinary number of new IT start-up companies in Taiwan."

### Please don't go

All players in the IT industry, from educators and recruiters to employers and governments, are having to change tactics. "You can't expect to stick an ad in the paper and put your hand out for a fee," said Icon's Harris. Employers can no longer fax out a job description to agencies and get a quick result, added Morgan

& Banks' Rawlinson. Throwing money at the problem won't solve it either, said Vogel.

As the pool continues to dry up, the stakes will get higher. Training is being used not only to find staff but also to retain them, recruitment companies are taking over all the needs of some larger organisations, little extras are added to packages to keep staff happy, and there is more reliance on outsourcing (this in turn creates another problem as the outsourcers themselves poach workers to meet requirements).

The crisis has resulted in a lot more thought being taken by all players, said Rawlinson, but some of the well-worn retention and lure strategies are still being used, particularly competitive compensation rates.

Money still helps find people, and companies need to be prepared to pay the dollars to keep them onboard, said Hedley. Sign-on bonuses are offered just to get personnel, particularly sought-after graduates, to start the job. 'Golden handcuffs' (you stay until the end of the project and they'll pay extra) are also popular. Overseas posts are also an enticement to stay.

People will be headhunted, and they will look around out of curiosity for new positions, so you have to keep them happy, as well as make your company attractive to potential employees. In the US, salaries are increasing 20% every quarter, said Vogel. Australian salaries are also increasing, although at a lower rate.

Money, said Vogel, is the only incentive for loyalty in the US. In Australia, companies are beginning to pay 'loyalty payments' to keep staff onboard, said a Gap IT Consulting representative, particularly if an investment has been made to upgrade a worker's skills. A \$50,000 programmer whose skills have been upgraded could now get \$80,000 somewhere else, he said.

Wages will stop increasing at such rates: companies just can't afford it. "We believe management must evolve and begin to change the way in which employees are recognised by the organisation," said Vogel. "A lot of organisations fear getting into a bidding war for staff. The labour shortage only affects IT, so there is not a lot of understanding by management on the amount of money being spent, or that needs to be spent. To get an increase in budget is difficult."

So they come up with other sorts of incentives, she said (see 'Tickling the fancy', page 83). "These are not things that will keep someone from leaving — money



# Experience the world of Megapixel digital reality

**RDC-4300**

3x continuous optical zoom lens, with 180 degree rotation incorporating superior quality Ricoh Optics consisting of 9 glass elements in 9 groups, including 2 Aspherical lens elements (equivalent to 35-105mm in a 35mm camera).



Super bright, easy to view 2 inch polysilicone LCD (110,000 pixel) with 9 shot multi-image playback plus 2x magnification zoom playback.

Utilises ultracompact and versatile Smart Media removable memory cards that offers high compatibility and maximises cost performance.

Easy to use operation with total user flexibility and customised user select settings option.

Professional quality 1.32 million pixel CCD, producing precise resolution and brilliant colour contrast 1280 x 960 pixel images.

5 picture taking modes; still, still with sound, sound, text and text with sound plus 7 recording modes providing the choice from maximum quality to maximum quantity of images.

**RICOH**

Ricoh digital cameras.  
*Tomorrow is today!*

Telephone (03) 9888 7722  
Facsimile (03) 9888 7644  
<http://www.ricoh-aust.com.au>



does that — but it will keep them from proactively searching for a job elsewhere.”

Thankfully, it appears Australians are less mercenary than their US counterparts. All recruitment specialists we spoke to said decisions on jobs involved more than the accumulation of wealth. IT professionals here are motivated by the ability to learn new technologies as well as by becoming involved in interesting projects, job security, and lifestyle.

## Changing tactics

Like the technology industry itself, recruitment tactics evolve. The strategies used to

attract and retain staff need to be updated, as some of the models that once hauled in the workers will no longer do so.

META Group produces an annual staffing guide advising clients on hiring strategies. It now also releases nine reports a year to update staffing and compensation trends. It, for instance, advises clients that newspaper job advertisements don't work. “The top 25% of IT individuals don't read the want ads. It is very difficult to see

what a job offers by reading an ad,” said Vogel. The Internet is now the main means of recruitment, she said, as the reach is wider.

In Australia the trend is towards Internet recruitment, but newspaper ads are still popular. “The US market is different to the Australian market,” said Computer 2000's Bays. “We do use the Net and get a huge response, but we have to weigh quality against quantity. For senior roles you get a better response through the papers, but for junior roles it is OK on the Internet.”

Morgan & Banks is the largest advertiser in the IT section in *The Age* on Tuesdays and it still finds it very profitable. However, it also receives 50% of its résumés by email, said Rawlinson. Icon is using the Internet to allow candidates to update their own résumés, customers can view candidates, and there is the capability to pay contractors and invoice customers, said Harris.

Other companies are doing it on their own; Cisco, for instance, has its own ‘best-in-class’ recruiting program, based on its belief that people are the best asset an organisation can have. It defines the type of person it wants and tries to attract them. It uses employee referrals, as well as a ‘friends’ program, which assigns applicants to a Cisco worker who can answer questions about what it is like to work for the company. It even uses focus groups to find out how ideal candidates spend their time, what Web sites and movies they visit. Research has led Cisco recruiters to some non-traditional recruiting grounds such as art fairs and home and garden shows, says META's *Human Capital Management Report*. It even has a link from the Dilbert site to its own, Vogel said. Other companies advertise at the movie screenings it believes potential workers attend.

Gateway has taken a different approach: its recent restructure announcement will see particular divisions moving locations to be where it believes it will find the largest pool of staff.

More employers are partnering with recruitment companies that can provide for their needs across the board, from cleaners to programmers. Alliances mean companies can work together with a spe-

## Who will it be?

There are three people in a room: one young woman with flaming, long, red hair, one muscle-bound beachgoer and a sunken-chested young man with glasses and the beginnings of a bald patch. Which one is the IT worker? Most people would pick number three, but in fact it is all of them.

The IT industry has an image problem. Who wants to work in a field filled with rooms full of non-communicative men with weird hobbies, pale from lack of sun, sporting thick glasses and buck teeth?

While the days of the backroom boys of IT are long gone, the prevailing negative image is stopping young blood from entering an industry in desperate need of resources, say analysts and recruitment representatives. The Information Technology Association of America (AIAA) has set up an Image of IT Professions Task Force to work on ways to alleviate misconceptions about IT careers. It will emphasise the dynamic, exciting opportunities the field offers by a national industry-led promotion campaign, a spokesperson said.

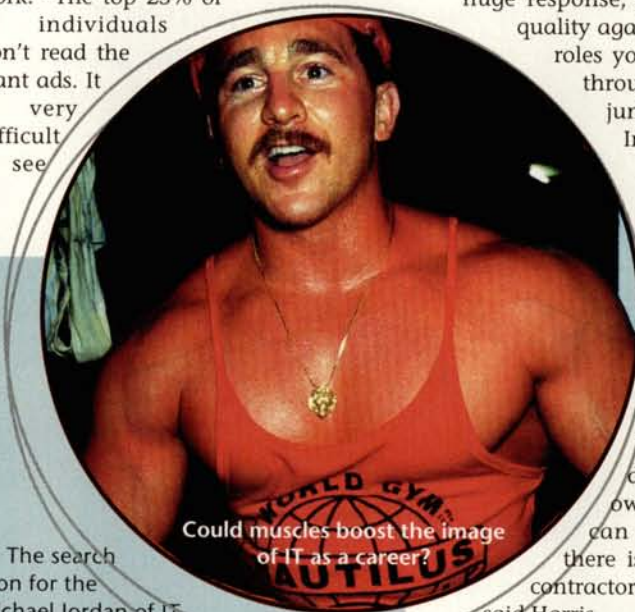
Gartner Group's *Australia's IT&T Future* report noted that society needed to hold people with science and engineering degrees in more esteem, that more people needed to enter IT&T related courses, and that work needed to be done with younger children to help them understand the potential for careers in the industry. More ambassadors were needed to go to schools and colleges to inspire and encourage.

Television programs have also been suggested. When ‘LA Law’ was first launched, law school applications were up 25%. “I would like to have seen Seinfeld's computer turned on,” said the AIAA's Hedley.

The search is on for the Michael Jordan of IT, a representative to sell the industry. Most agree Bill Gates is not a suitable ambassador. “He does give off a nerdy image that people are not attracted to,” said META Group's Vogel. Hedley was one dissenter. “Bill Gates is the richest person in the world: the nerd image does have a gloss to it.”

Hedley visits schools to promote careers in the IT industry. “It really is a good career. You work in a team environment; there is constant learning; you are dealing with technology but also people; you are involved in innovation and creation; it is a young industry (the average age is 35); it is clean; you can travel the world . . .”

It is also still predominantly a man's world, said the Gartner report. Much needs to be done to persuade more women to enter the IT&T professions, it said. “False perceptions have to be changed, perhaps through some form of Web initiative that targets young women, or through the active assistance of magazines that sell into this demographic. Women who are in IT&T have a role to play through active promotion of the industry and by being profiled as leading examples.”

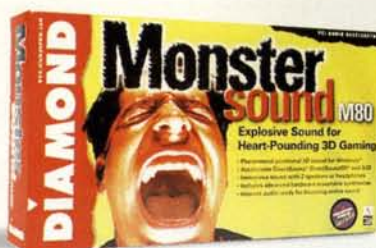


Could muscles boost the image of IT as a career?





3D Entertainment



3D Audio



2D/3D Accelerators



Professional 3D Graphics



High Speed Modems



Ultra Wide Dual SCSI

# Diamond

## accelerates

## a whole new

## world of PC

## performance.

**AUSTRALIA**  
CHIPS & BITS AUSTRALIA  
PTY LTD  
TEL: 61-3-9696-1911  
61-2-9680-9600  
61-7-3277-0599  
61-9-228-0088  
61-8-359-3555



FOSH AUSTRALIA PTY LTD  
TEL: 61-3-9532-9322

TECH PACIFIC PTY LTD  
TEL: 61-2-9381-6000

Available at **Harvey Norman** stores.



[www.diamondmm.com.au](http://www.diamondmm.com.au)

Nobody offers you a more exciting selection of high-speed multimedia solutions than Diamond Multimedia. Our award-winning 2D/3D accelerators include the Viper, for true world-beating 128-bit performance; Stealth, the family of graphics accelerators for business and entertainment; and Fire GL, the new choice in professional graphics solutions for 3D animation, VRML and CAD applications. Our Monster Sound audio cards have revolutionised PC gaming with heart-pounding 3D immersive sound, while the Monster 3D series brings you the ultimate in 3D games acceleration. Our powerful SupraExpress 56K modems deliver extraordinary performance for high-speed Internet access. And our FirePort UltraWide SCSI host adapter kits, connect as many as 30 external SCSI devices to your PC or workgroup server. For more information about these and other fine products, contact the computer retailer nearest you or visit us at [www.diamondmm.com.au](http://www.diamondmm.com.au).

Monster 3D and Supra are trademarks of Diamond Multimedia Systems, Incorporated. All other trademarks are the property of their respective owners. ©1997 Diamond Multimedia Systems, Incorporated. All rights reserved.



**Accelerate your world.**



## Why go?

If you are lured by money, it appears the US is the place to head. One worker who recently left Perth to work in Seattle noted the pay benefits, but also said the advantages of working in a much larger technology arena is a true investment in his career.

"When you take into account the exchange rate and the US taxation system, salaries are nearly twice those of Perth," said the well-known Internet entrepreneur. "Cash incentives are also common — usually up to \$US20,000 upon commencement. On top of that, the stock options in a start-up company can make you a millionaire in a couple of years. Even the stock options in the best established companies are worth at least \$US40,000 per annum. And if you are working in the Internet area, then the sky is the limit.

"I had progressed as far as I could in Perth, so there were no real further opportunities for career advancement for me. I started to get very bored with what I was doing, because we have lagged a little behind the US in some areas.

"Australia has no attraction to me now in terms of starting a business venture. The red tape, the taxation system and the lack of investment money make it very unattractive compared to the US. I have done it once and it was very successful, but I don't care to repeat the experience.

"Access to people and technology is

excellent [in the US]. The opportunity to network with colleagues and peers is also very good, and it is a great opportunity to learn. The size of the market in the US changes the equation somewhat, and the availability of venture capital is also excellent."

Charles Small, who is working as a contractor for an international company in the US state of Georgia, is treating his three-year contract as a working holiday. His company advertised in Australian metropolitan dailies to gather workers for the US. "They helped set up a three-year work visa, pay airfares for the family, and supply 30 days' free housing, a rental car and a good salary," he said.

"The exchange rate is great. We send home US dollars, which helps pay off our mortgage. We bought a new car for one-third of the price [it would cost] at home. With no credit, the dealers will sell or lease a new car based on the contract job we do."

Small said his company hires from outside the US only, searching for those with world-class skills. "They want a wide variety of skills and two to three years' experience. A BA degree is important to them." Small has 17 years of Cobol mainframe programming experience on IBM, Unisys, Honeywell and Burroughs.

The ease of finding a job was noted by both workers. "I had four great offers within the first month, and they all tried

very hard to win me over," said the West Australian. "I got wine and dined. One company hired a limo and took me to the best restaurant in San Francisco for a party. Another flew me across the country on two occasions just to meet with their team. It was a great boost to the ego!"

"There are plenty of jobs in all-size towns," said Small. "The company I contract with has six IBM programmer jobs vacant today. The standard pay rate is \$US35 to \$US40 per hour. This company has had to fly in consultants, and pay room and board just to get the year 2000 project moving."

"I put my résumé on the Internet in Atlanta to see what the job market was like. By the end of the day I had to remove it. I was overwhelmed by responses."

There are, however, some difficulties to overcome when working in the US, both said.

"The US visa system is a nightmare," said one. "There is an annual quota of H1B visas, and this year they have run out until October 1. So you need to do your research before you come across. Your employer will offer to help this process, but don't underestimate the problem."

Small added that it is not easy for spouses and partners to find work, and although his company helped out in his case, it was time-consuming.

cialist firm to search for people. In many instances this also involves setting up global pipelines for resources.

Links are also being forged between industry and educational institutions. Morgan & Banks, for example, has entered into a partnership with the Royal Melbourne Institute of Technology in an attempt to fast-track teaching of skills that are particularly in demand.

Recruitment firms are also becoming trainers. Icon has a Proactive Recruitment Arm, whose job it is to manufacture skills for clients. They find raw graduates, not just in IT, but in arts and psychology as well — all that's required is an interest in IT. At present it is providing structured courses for Cobol analyst programmers and Y2K-compliance testing. These are run continuously in all capital cities, and cater for 15 to 20 people.

One client of another recruiter couldn't find skills in a particular banking software application, so the recruiter gathered

together some business analysts and 'reprogrammed' them with the necessary skills. Any time an organisation is planning a new technology implementation, it should first research just how easy it will be to find the skilled workers to implement, maintain and use it. In most instances a hefty training bill should be expected, APC was told.

### Teaching old dogs new tricks

Many employers are using training to their advantage. Workers have to be constantly reskilled to keep up-to-date with technology, and they are training staff who have obsolete skills in areas of high requirement, as well as offering courses as an incentive to keep prized workers on the payroll.

"If you invest in your existing staff, you are less likely to lose them," said Steve Ross, general manager for Com Tech Educational Services. Poachers are luring staff by offer-

ing training to potential workers, and companies are responding, he said. A recent survey among Com Tech trainees found they expected their employers to offer them 10 to 20 days of training per year.

As there are not enough people to recruit from outside, organisations are reskilling from within, said Ross. One major telecommunications company is shedding staff, but retraining many in areas of high demand. "Companies are all fed up with fighting for the same small pool of people, and there are not that many graduates each year. The graduates are coveted, and most are snatched before they complete courses," he said.

However, it is not a matter of taking just anyone and reskilling them. IT workers need certain attitudes and aptitude, said Ross. "They also need to be logical and organised and critical about how things work, as well as quick to learn about new technologies."



# Writing CDs. Kodak's Ahead.



## EXCEPTIONAL PERFORMANCE IS QUITE NORMAL WITH KODAK.



Treasured memories, music, or just plain business, you'll feel much more secure when those digital files are stored on a Kodak CD-R. The KODAK DIGITAL SCIENCE CD-R stores up to 650 MB of text, images, graphics, and drawings safely and securely. KODAK INFOGUARD™ Protection System helps ward off careless fingerprints and scratches, and our stable dye chemistry provides a data life of over 100 years. For more information visit our Web site at [www.kodak.com/go/cdr](http://www.kodak.com/go/cdr) or call (03) 9353 2488, Freecall 1800 674 831.

**Kodak** *ds*  
digital science™  
SOLUTIONS



Despite images of the non-communicative geek, some people are attracted to the industry and seek training. They range from country veterinarians looking for a change to mothers re-entering the workforce, said Yeoh from Computer Power. However, re-skilling doesn't come cheap: an SAP course or comprehensive networking course can cost \$9,000. Even science or engineering degrees are expensive now, due to increases in HECS charges.

Once trained, the fun begins, warned Rawlinson. As an IT contractor, particularly, you need to be one step ahead, always keeping up with the new technologies, he said. "You need to ask yourself what the new technologies are and how you can avoid being yesterday's person."

There will always be new technologies and new applications. Many skills in areas popular 10 years ago are not worth a sausage today, said Rawlinson. "There will come a time when SAP and Oracle workers won't get high rates because there won't be a demand."

### Flexible education

The provision of flexible and responsive education is crucial to meet the growing need for IT skills, according to Professor Ashley Goldsworthy in his report *The Global Information Economy: The Way Ahead*.

Communication technology literacy must be treated as a fundamental life skill, he said, and learning it must start early. "No child should leave school without mastering a basic level of skills and knowledge of the application of information and communication technology to their chosen subject areas." The Gartner and Goldsworthy reports stress the need for more funds, from both the government and the private sector, to achieve this.

"Various state and federal programs

that install computers and the Internet into every classroom will ultimately bear fruit, but the industry needs to provide input too," states *Australia's IT&T Future*. It suggests IT&T companies commit to donating used computer systems to local schools and recognise and reward staff that offer skills to schools.

If we are to meet needs, we must create more tertiary and postgraduate places, said Goldsworthy. The Gartner report adds that Australia needs more innovative IT&T related degrees, and IT must become an integral part of all courses. "It also means governments should actively promote entrance to universities for science and engineering courses, rather than doubling HECS for these students. At least the government has made some progress in ensuring all students nationwide have access to computers, with EDNA [Education Network of Australia] as a notable example.

"In Ireland, Israel and Taiwan, studies point to major increases in government spending on the provision of large numbers of advanced science and engineering courses at universities as being one of the most important catalysts, which eventually led to all three economies growing their IT&T industries significantly. Ireland is now the second largest exporter of software in the world, and IT accounts for 38% of Ireland's total exports. Today 71% of Ireland's university students are studying engineering, science or business."

There also needs to be more partnerships between industry and educational institutions to ensure course relevance. "University environments have tended to emphasise theory and research, whereas industry places more emphasis on reliability, best practice, broader communication skills, and industry experience," said the Goldsworthy report. "In software and systems integration, available skills are not at a high enough level. While routine pro-

gramming skills are available there is insufficient strength in project management."

QUT now offers a Master of Information Technology course by flexible delivery, utilising the Internet. The course was set up in just six months. The previous masters program, which is still available, obliged students to attend two nights a week and access labs at other times, and students were finding it difficult to get to classes because they were working on major, time-consuming projects or being called out of town, said QUT's Smyth. The course materials are available through a mixture of Web, CD and print material. Discussion forums, email and IRC will be used to facilitate communication and collaboration between lecturers and students.

In another example, Motorola Australia has donated \$65,000 worth of in-circuit simulators to Swinburne University of Technology so electrical engineering students can learn embedded chip debugging and design skills.

### The future

Some may already be tired of hearing about the IT skills shortage, but concern about the problem is now widespread. "IT workers are probably the best industry group at making mountains out of molehills; they hype everything out of all proportion," said Morgan & Banks' Rawlinson. "Maybe this isn't going to be as catastrophic as they say, but it is a real problem and it is going to get worse before it gets better."

The various strategies outlined above could improve the situation, but the IT industry has something else in its favour, said Rawlinson. "This is a very, very robust and innovative industry. We may make some skills obsolete. Next year's demand could have a solution that we haven't even thought of yet."

So, here's to the future. ■

## Subscribe to School PC today!

**School PC Australia** covers both IBM-compatible platforms as well as Apple computers. *School PC Australia* is the magazine for all Australian schools — primary and secondary, public and private, rural and city, including special purpose schools — across all states and territories.

**SUBSCRIBE TO SCHOOL PC AUSTRALIA FOR ONE YEAR (10 ISSUES) FOR ONLY \$19.00**

**CALL 1800 252 515 AND RECEIVE EVERY ISSUE!**





Hyundai DeluxScan monitors  
are a breakthrough in space.



DELUXSCAN®



MENU

SELECT



less money and less  
desk-top space

Introducing the Hyundai DeluxScan 7770 Dream. A breakthrough 17-inch monitor whose unique reduced-depth CRT gives it virtually the same profile as a 14-inch. And that means more space and better ergonomics for users. But that's not all. The 7770 Dream is as easy on the eyes as it is on the desk space. A shorter electron gun-to-screen distance together with dynamic focusing circuitry delivers ultra-sharp focus while a crystal pigment coating on the CRT phosphors produces outstanding contrast and brightness. And that's something user's eyes will thank them for every day. The DeluxScan 7770 Dream - Another breakthrough in monitor ergonomics, convenience, and performance from Hyundai.

DeluxScan Monitors						
Model	5870	7770	7770 RD	7695	9695	2595
CRT Type	15"	17"	17" Short-Neck	17" High-Contrast	19" High-Contrast	21"
Viewable Area	14"	16"	15.7"	15.7"	18"	19.5"
Dot Pitch	.28mm	.27mm	.27mm	.26mm	.26mm	.25mm
Horiz. Frequency	30~70 khz	30~70 khz	30~70 khz	30~95 khz	30~95 khz	30~95 khz
Max. Resolution	1280 × 1024	1280 × 1024	1280 × 1024	1600 × 1200	1600 × 1200	1600 × 1200
On-Screen Menus	Yes	Yes	Yes	Yes	Yes	Yes
TCO option	TCO '95	TCO '95	TCO '95	TCO '95	TCO '95	TCO '95
Win.98 ICM profile *	Available	Available	Available	Available	Available	Available

\* Windows 98 ICM profile : For display-to-printer WYSIWYG, Windows 98 requires ICM (Image Color Matching) profile for the display monitor. This profile is available free of charge at the place of purchase, or directly from Hyundai.



DELUXSCAN®



Electronic Resources Australia  
02-9736-3688

<http://monitor.hei.co.kr>  
[www.hei.co.kr](http://www.hei.co.kr) (eng/product/multi/monitor)

● Headquarter (Hyundai Electronics Industries Co. Ltd) San 136-1, Ami-Ri, Bubal-Eub, Ichon-Si, Kyunggi-Do, Korea Tel : 82-336-30-3826 Fax: 82-336-636-4231  
● Hyundai Electronics America Tel : 800-568-0060 Fax: 408-232-8146 <http://www.hei.com> ● Hyundai Electronics Asia Pte. Tel : 65-432-4560 Fax : 65-33-65-911  
● Hyundai Electronics Hong Kong Ltd. Tel : 852-2971-1612 Fax : 852-2971-1623 ● Hyundai Electronics Taiwan Tel : 886-2-2713-4204 Fax: 886-2-2713-4299  
● Hyundai Electronics Deutschland GmbH Tel : 06142-921-237 Fax: 06142-921-293

Investing Today, Leading Tomorrow

HYUNDAI



**It's hard to improve  
Hansol's picture quality.  
But we've made it easy to try.**



If you're looking for great picture quality, picture this. An advanced 17" (15.7" viewable) monitor with a .26mm dot pitch, 1,600X1,280 resolution, and a truly flicker-free refresh rate. All housed in a radical, modern design as cutting edge as the technology itself. It's a hard to beat picture. But trying couldn't be simpler. Because the 700 P features a drop down panel that easily and completely controls the entire system with 20 on-screen settings including colour, brightness, contrast, size, position and more. Not to mention a zoom-in that will knock you out. So if

**Hansol**

you're looking for a great picture quality, reliability, and customer service, contact your distributor and take a look at Hansol. Then take it easy.



**KOA**

For more information, call (02) 9416 4377 **KOA GROUP PTY. LTD.** 8 Havilah Road LINDFIELD NSW 2070

**OR**

NSW - Bu-Tek Industries Pty Ltd (02) 9748 8988 . Austar Development P/L (02) 9742 5577

VIC - Bu-Tek Industries Pty Ltd (03) 9558 9788 . QLD - Source Technology (07) 3300 9999

Intec Distribution Pty Ltd (03) 9467 6822



Subscribe to...

# Australia's leading computer magazine

**apcmag**

***Subscribe or  
renew now***

by completing and  
returning the order  
form on the reverse  
of this card.

***For immediate  
attention,***

please use our Fast  
Phone Service.

In Sydney ring  
(02) 9260 0091.

Elsewhere,  
1800 252 151  
— a free call.



**YES!** Please arrange my subscription to *APC*, Australia's leading computer magazine.

**Please tick one box only:**

- ☐ 1 year (12 issues) \$65.00      ☐ 2 years (24 issues) \$125.00

**Payment details:**

- ☐ I have enclosed cheque/money order for \$\_\_\_\_\_ made payable to ACP Direct. **Or**  
☐ Please charge \$\_\_\_\_\_ to the credit card nominated  
☐ Bankcard   ☐ Mastercard   ☐ Visa   ☐ Diners Club   ☐ American Express

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Signature	Expiry Date
-----------	-------------

Mr/Mrs/Miss/Ms	Initials	Surname
----------------	----------	---------

Street Number	Name
---------------	------

City/Town/Suburb
------------------

Postcode	Daytime Phone Number
----------	----------------------

Offer only applies to Australian residents.

9809APL

No postage stamp required  
if posted in Australia



Reply Paid 764

ACP Direct

GPO Box 4967

Sydney NSW 1028



# Fear and loathing on the VC trail

Since our landmark feature last December, venture capital has surged into the national technology consciousness. But are Australia's problems being addressed? **By Dan Tebbutt**

"GROW fast or DIE"  
Juniper Networks product launch



"The starting point has to be that growth, in itself, is meaningless unless it is profitable growth"

Leon Davis, Australian CEO of multinational RIO Tinto Mining



RINKEL

**T**he juxtaposition of these quotes from Leon Davis and bold Silicon Valley startup Juniper Networks does well to highlight the difference between Australia's investment climate and the US high-tech boom. Australia: conservative, incremental, conventional. Silicon Valley: ambitious, melodramatic and direct.

Yanks may blow hot air, but their capacity for bold vision stands in stark contrast to Australian thinking. Our businesses follow a very traditional logic: start small, turn a profit then grow. Nothing could be further from Silicon Valley's imperative to think big, grow fast, capture market share, build brand and then look for sustainable profit. It's a high-risk strategy that generates many more failures than success stories, but no-one can deny the value of this adventurous approach in the very measurable prosperity of the US technology industry.

## Think big

Aggressive projections are necessary to rise above the din of Silicon Valley. "The starting line is so crowded that startups need to claimed victory on day one," claimed leading Valley venture capitalist Ann Winblad.

For Lou Schillaci, CEO of award-winning Perth developer NDG Software, six months working US cash corridors proved highly educational in the ways of the Valley. Time-strapped VCs don't want to hear about ambitions anything short of epic. "There's no point seeing Kleiner Perkins [Silicon Valley's top VC firm] if you don't have a plan for a billion-dollar company," Schillaci explained.

Why does Silicon Valley prize growth more than profit? It's all about momentum. In a low-friction market like software, theorists claim technology and immediate profits matter far less than timing and control. Quickly bringing products to market allows a vendor to capture the upper hand. The first person to demonstrate control will be the ultimate victor, irrespective of short-term returns or technological merit.

To the victor come the spoils. Just ask Bill Gates, the Sun Tzu in the art of IT war. In operating systems, desktop applications, servers and the Internet, Microsoft was second to market and usually with inferior products. But the Seattle giant pursues an unstinting growth strategy, even at considerable short-term cost, until it gains 'hand'. Growth leads to control and control leads to profit. Apple, Lotus, Novell and Netscape may have tasted the cream, but Gates ended up owning the cash cow that pumps it out year after year.

Turbo-charged growth is risky and capital-intensive. Flooding trade shows, magazine covers and potential customers with demo software is an expensive business. One wag dubs this the 'URL' approach: ubiquity first, revenues later.

Returns are far from guaranteed. Many leading exponents of the growth-first





model (including portal companies and Internet software houses) remain paper tigers, with huge capital valuations founded on potential revenue rather than actual profit. Yet the US market steams ahead, boldly expecting profit to arrive.

Such optimism is much harder to justify to sceptical investors down under. Chris Yeoh, an Oracle veteran who returned to Sydney to start extranet software developer Illumin8, feels high-growth strategies are very difficult for Australian companies because they require generous funding to grow fast and capture markets. Because Australian investors have not yet experienced lucrative successes, capital-fuelled growth is considered too risky. "It's out of the comfort zone," said Yeoh.

Dawson Johns, CEO of serial innovator Labtam, believes steroid growth is almost impossible in Australia because stock market rewards remain elusive. The high road



may work if the company has sufficient capital to fund a dramatic entry into the US market — but only if the IPO (initial public offering) target is Nasdaq, the tech-heavy stock market that houses the majority of digital age success stories (see sidebar, page 86).

Until a couple of successful role models emerge, Australian investors may be justified in their caution. But until Australian companies are backed to pursue US markets like a US company, we may never reach the starting line.

"You've got to be bold or you will get steamrolled," advised Larry Lopez, senior vice-president of international alliances at Silicon Valley Bank, a specialised financial services company. He said startups must be "instantly upsizeable" so they can swarm into a lucrative market opening.

"I've seen more companies fail because revenues were above expectations, not because the revenues were not there," he added. "In IT, the growth rates are so high there's little margin for error."

### Instant multinationals

After two decades of governments chanting the export mantra, every Australian knows the importance of global markets. Yet three-quarters of local IT developers start out focused on domestic sales, according to Rob Norton, director of the Playford Centre, a joint venture between the South Australian Government and its IT outsourcing contractor, EDS. The centre helps startups prepare to become investment candidates by improving management structures and clarifying the vision and sales pitch.

Playford is currently working with around 50 companies, the vast majority seedlings. Most need convincing before they'll address export markets. "Outside markets are not as bad as they look," Norton said.

In fact, Australia's robust domestic IT&T market could be more hindrance than help, according to David Blumberg, a

# 10 Mbps, 100 Mbps, VLAN. And

## Layer 3 Switching

Now the Intel® Express 550 Routing Switches let you segment your network to reduce congestion and increase security — more simply, quickly and economically than with a traditional router.

## Easy, Comprehensive Management

Advanced Web and Windows® based management tools simplify installation, management and configuration.

## 10 to 100 to 1,000Mbps

Autosensing on each port delivers Fast Ethernet when and where you need it, and the Gigabit Ethernet module provides support for connecting to the backbone, switch-to-switch and switch-to-server.



## Scalable Stackable Technology

With Intel's Scalable Stacking Technology, performance is also scalable. Every switch you add to a stack brings with it an additional 2.1 Gbps of bandwidth to the high-speed backplane. So as your network grows, your switching capacity increases to meet the new demands.



## Fibre

2-port 100FX module supports long-distance fibre connections over distances up to 2km.



San Francisco investment adviser who helps Israeli startups penetrate Silicon Valley. The complete absence of a domestic market in Israel makes entrepreneurs focus immediately on export sales. "Those startup companies must be international from day one or they will not survive," he said. "You have to think world class right out of the barrel."

Focusing on a domestic market can harbour complacency, Blumberg argued. Furthermore, local waters offer only temporary refuge because eventually well-heeled multinationals will invade your shore. John Dyson, Melbourne-based general manager of Japanese financier Nomura Jafco, whose Australian investments include Hypertec, believes the domestic market is a good proving ground for a product concept, but the ultimate aim must be to tackle the US.

The challenge is not to be underestimated. "Australia can't compete [with] its current population, so it has to look to export. Export is more difficult, costly and risky than attacking a domestic market," suggested Yeoh, whose company is cur-

rently tying down funding for a US sales office. "[Entrepreneurs] almost need to take their technology from startup to the world stage in their first step," concurred Tony Jansz, Intel's director of Asia-Pacific business development. "That's a very difficult thing to do."

### If you can make it there . . .

Frank Sinatra's famous refrain about New York aptly explained the magnetism of Wall Street last decade, but in the late

pelled daily in the US business pages. If locality holds no value in the digital epoch, why is an old-media company like Knight Ridder moving its corporate headquarters from Florida to Silicon Valley? Why does Eric Schmidt lead Utah-based Novell from San Jose? Even mighty Microsoft is bulking up its Silicon Valley operations.

"It's ironic that as the tyranny of distance is being dramatically and forever cut because of the Internet,



**"If Australia can mimic the Israelis and promote the country as a fountain of investment opportunities, it should acquire a reputation and start to attract real interest."**

1990s it applies to Silicon Valley. Anyone with the slightest interest in company building views the Northern California peninsula as the Holy Land.

Suggestions that the Internet would abolish the value of proximity are dis-

low-cost telecommunications and satellites, at the same time there is a parallel phenomenon: speed to market is so critical," said Blumberg. "It's like a snowball turning into an avalanche."

# Gigabit, Fibre, Layer 3, then some.



### Intel's Adaptive Technology

Optimises performance independently on each port, dynamically adjusting the switching mode based on traffic conditions.

### VLAN Support

Offers a new level of flexibility in segmenting corporate networks, offering increased performance, management and security capabilities.



For details of how the Intel® Express 500 series of switches can help you manage your evolving network call 1800 818 106, or simply visit our web site.

[www.intel.com/au/switch](http://www.intel.com/au/switch)

**FasterSimpler  
NETWORKS**

Intel's switching solutions deliver flexibility and enhanced performance that adapts as the needs of your network grow.

**intel**



Eventually, he surmised, California will hit the limits of real estate and people. That will encourage companies to spread out so "the head of the organism can be in Silicon Valley but the body can be far flung and virtual". Then Australia's low R&D costs will be a great advantage. Indeed, some suggest the declining Australian dollar could even encourage US startups to move R&D down under.

Nevertheless, Silicon Valley's boom does not look like slowing down any time soon. VCs are all too aware of horror stories where dispersed R&D efforts lost touch with sales and marketing. And R&D costs are not as important as speed, quality and innovation, because development is only a small part of the end product cost. "It's more important to deliver high quality first," said Blumberg.

Establishing effective distribution is a make-or-break play for startups so far from the volume markets of Europe and the US. "In a fast moving sector like IT, to finish up with a global product which is profitable you have to get there very quickly," said John O'Farrell from Venture Capital Partners, an expansion finance specialist. "The way to do it is not to try to reinvent IBM, as some entrepreneurs try to do, but to use other people's existing distribution channels and leverage off them."

Blumberg emphasised the "hypercritical" value of partnering. For instance, one of his clients, firewall specialist Check Point Software, pursued a distribution deal with Sun Microsystems because Sun was the leading Internet server software vendor. The deal catapulted Check Point into the box seat for its intended market. Ecommerce and online software distribution are very practical, but a channel can still stimulate demand and build greater success. Strong customer references, preferably with multinationals, help companies approaching the US, and Blumberg stressed the importance of attending trade shows to establish presence and keep abreast of industry trends.

Austrade can help small Australian companies penetrate the North American trade show circuit. The 25 Australian companies who attended Comdex last November generated \$1.5 million in sales at the show, plus \$74 million worth of exports forecast for this year. Another 14 Aus-

tralian exhibitors at the E3 games industry expo in Atlanta generated \$1.2 million in stand sales and \$18 million in first-year exports. "These two shows have really put Australian IT on the map," claimed Austrade's assistant trade commissioner in San Francisco, Stewart Gow.

## Money talks, genius walks



The difficulty of attracting international VC interest means many Australian companies must consider relocating to the US. For instance, Illumin8's strong showing in Las Vegas, including the prestige of being named a Best of Comdex finalist, drew attention from US VCs. But most would not invest over the oceans. Local funds managers were soon in touch and Illumin8 is currently conducting due diligence. Happily, a deal at home could revive US interest through the VC's extended contacts, including the possibility of second-round financing to launch Illumin8 overseas.

"A VC's most precious resource is time, so anything out of the ordinary as far as logistics are concerned risks immediate dismissal," said one Australian entrepreneur leading an expansion into the US. "If Australia can mimic the Israelis and promote the country as a fountain of invest-

Once the company is ready, US investors can help paint a 'vanilla' American storefront. Australian VC support provides good credibility for US financing, in Blumberg's view. OzEmail CEO Sean Howard recalled from 1996 the surprise of Valley investors who took it for granted the company had started through VC processes at home before seeking expansion finance on Nasdaq.

The bottom line is that Australia must foster a domestic market for early-stage capital support. Industry Minister John Moore recognised this in June at the Australia Summit in Melbourne: "The great success of the American economy has been their ability to muster venture capital to R&D in the Silicon Valleys of this world. That has been one of our failings in Australia."

## Canberra to the rescue

In December Moore's department announced a long-overdue plan to address Australia's early-stage venture capital difficulties. To set the VC ball rolling, Canberra established the Investment Innovation Fund (IIF), pledging \$130 million on a two-to-one matching basis against private money. Two specialist investment managers undertook a rigorous selection process to whittle 35 applicants down to five VCs who are licensed to invest IIF money along with their own (see table below).

"IIF is long overdue," said Mike Hilsden, CEO of IIF-backed Amwin Invest-

### IIF licensed funds managers

Fund manager	Location	Amount
Allen & Buckeridge	Sydney	\$80 million
Amwin Management	Sydney	\$41 million
Coates Myer	Brisbane	\$75 million
Momentum Funds Management	Melbourne and Launceston	\$30 million
Rothschild Bioscience Managers	Melbourne	\$42 million

ment opportunities, it should acquire a reputation and start to attract real interest."

In reality, Australians must find seed financing here because it won't come across the Pacific, Lopez believes. "It's really hard to get seed money anywhere," he added. Blumberg pointed out that only 11 out of an estimated 2,000 VC deals in Israel involved direct US investment. Most US financiers prefer entrusting money to an early-stage fund in Israel so they can 'cherry-pick' the best fruit.

"Our companies have been starved of capital at the low end," Hilsden, a 25-year IT veteran who has led Bond Technology and biometrics pioneer Fingerscan, received over 150 business plans in three months and their quality generally demanded attention. Amwin recently contributed \$US1.5 million in expansion capital to Australian portal service LookSmart (see APC December 1997, page 97).

Ron Finkel, a veteran VC at Melbourne-based licensee Momentum Funds Man-



# server NICus robustus

A new breed of server adapter from Intel.

## Performance and Scalability

Adaptive Load Balancing or Fast EtherChannel increases throughput while distributing server traffic among up to four NICs.

## Reliability

Designed with higher integration, reducing failure and maintenance costs, and increasing reliability of your network.

## Quality

Four of the top five server manufacturers use Intel's advanced server adapter technology.



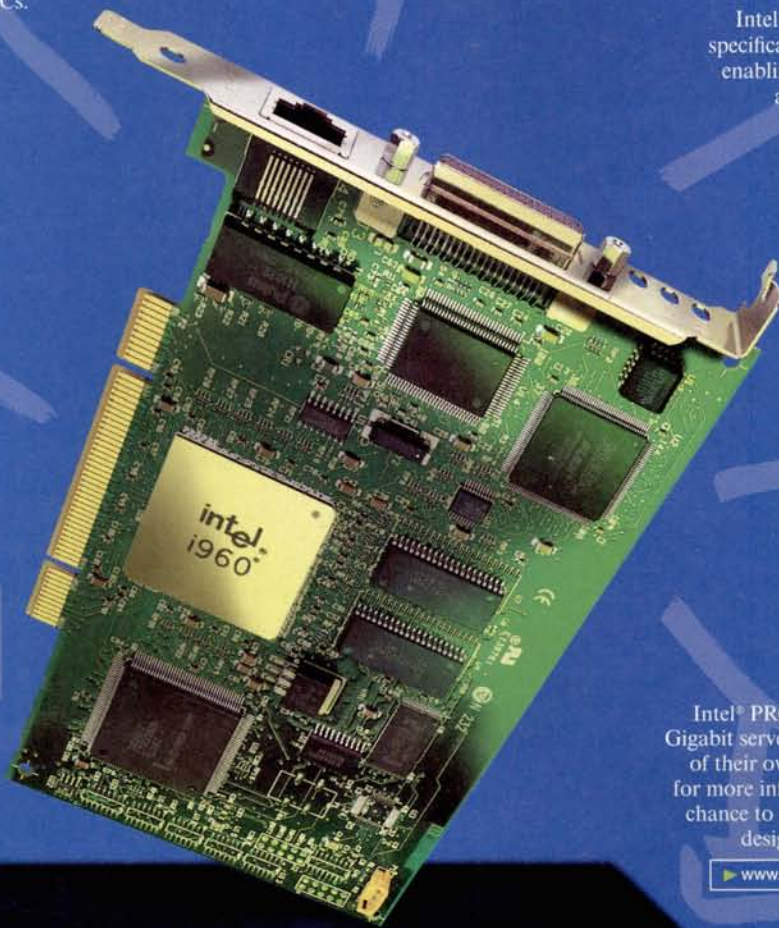
## Server Optimisation

Intel's family of Server Adapters is specifically designed for network servers, enabling maximum uptime, reliability and bandwidth scalability.

## Maximum Uptime

Redundant network connections transparently shift server traffic from a failed link to the remaining adapters for maximum uptime.

Faster Simpler  
NETWORKS



Intel® PRO/100 and PRO/1000 Gigabit server adapters are in a class of their own. Call 1800 818 106 for more information and for your chance to receive a free network design consultation.

[www.intel.com/au/adapter](http://www.intel.com/au/adapter)



agement, regards the current scheme as a "much more sensible" way to encourage investment. Tax-driven initiatives last decade overheated the market and encouraged both investors and entrepreneurs to burn through capital with little regard for returns. In contrast, he expects IIF to support a balanced, portfolio approach to investments where "due diligence and financing [are] driven by fundamentals not intuition".

Venture Capital Partners' David Gemmell sees IIF as a historic change that will stimulate early-stage equity and generate more opportunities for second-round specialists like VCP. IIF adds extra weight behind organisations that were already the best in the field, according to Schillaci, who has spent most of 1998 dealing with local VCs. But the Perth entrepreneur questions why no support was given to funds in Western Australia and other outlying areas. Finkel agrees this is a problem, especially since good VCs prefer proximate investments where it's easier to stay in touch.

## Home-grown VC

Australia's VC industry is still recovering from the excesses of the 1980s, according to Anne Howard, executive director of the Australian Venture Capital Association (AVCAL). Back then investments were driven by tax incentives like Management Investment Companies (MIC) rather than skilled assessment, and consequent low returns caused early-stage investment to dry up in the early 1990s. Howard said IIF is encouraging AVCAL's membership to explore seed funding again, but she admitted there's still precious little available.

Local VCs had \$1.6 billion invested in over 350 companies in 1997, according to Arthur Andersen's annual survey of AVCAL members (see <http://www.avcal.com.au/resources.htm>). Heightened interest in venture capital brought six new VC entrants and another \$150 million. During 1997, \$191 million was invested in 69 new ventures and a further \$120 million assisted existing endeavours. High-tech, biotech and IT&T firms account for one-third of AVCAL investments.

Employment at VC-backed companies grew 10 times faster over recent years than at Australia's 100 largest companies, according to a Coopers & Lybrand survey.

The five-year perspective found average sales growth of 42% for VC-supported companies, while profits climbed 59% each year and exports expanded by one-quarter annually.

Rob Norton believes Australia's investment community will remain conservative until these kinds of results are highlighted by profitable high-tech success stories. A Boston native, Norton came to Australia after hearing there was no VC for technology developers. "What

I've found is that there is money available but venture capitalists don't want to take the risks associated with technology because they don't understand it enough. They are used to resources and infrastructure."

The picture is starting to improve as money from superannuation funds starts to flow into venture capital, Norton believes. Andersen found super sources provided 72% of new funds raised last year, and almost two thirds of VC funds under management come from superannuation (see table below). Finkel claims

Yet structural impediments persist. For example, super funds covering employees of the Victorian Government and its statutory authorities were prohibited by law from investing in venture capital. Momentum lobbied Alan Stockdale, the State Treasurer and Minister for Multimedia, to address the anomaly and from June state super funds are permitted to place up to 1% of holdings into VC. With Victoria's public retirement stash estimated at \$20 billion, another \$200 million potentially comes into play. "It's desperately important that these funds put their toe in the water," said Finkel.

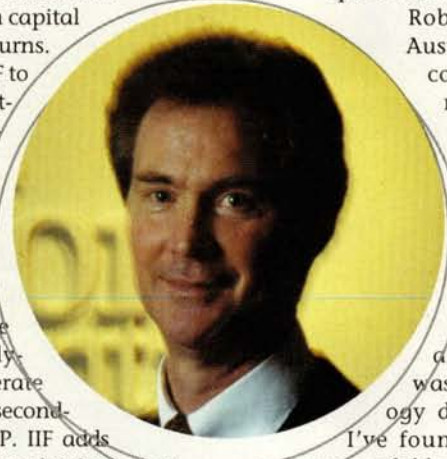
Lobby groups like AVCAL believe Australia must urgently revise capital gains tax (CGT) so local VCs can raise capital from US pension funds. Retirement savings are the financial backbone of Silicon Valley's VC-fuelled boom and they remain completely CGT-exempt in the US. But Australia refuses to excuse foreign pension funds from the full 36% CGT, which means Australian VC funds would need to outperform US counterparts by a third to snag big US bikkies. Howard suggested US retirement pools "are prepared to invest in our VC industry across the board", but current tax laws effectively bar this money from Australia. And money is not all we're losing: Howard believes pension fund investments would establish our credibility and forge stronger ties with US-based

VCS. "All of a sudden hundreds of doors would open," she asserted.

Finkel doesn't believe this issue is critical just yet because Australia has ample money for VC investment. "We already have more capital than deals available — we just need to free it up," he said. Andersen's AVCAL survey found VCs had more than \$900 million in uncommitted capital last year. Finkel warned that an influx of loosely managed foreign capital could re-create the

reckless cowboy environment of last decade.

Tax reform is in the Government's sights, and the primary challenge will be nurturing the long view. Both the US and Israel offer CGT concessions for long-term investment as opposed to speculative gains. Investments held beyond 18 months enjoy a concessional 20% CGT in the US, while Israel waives tax on long-range punts.



## Australian VC sources

Source	(\$ millions)	Share
Total superannuation funds	1,647.7	62%
Parent organisations	133.8	8%
Banks	382.5	14.5%
Insurance companies	32.9	1%
Private individuals	64.9	2%
Corporate investors	110	4%
Government agencies	23.5	1%
Sharemarkets	211.9	7%
Others	9	0.5%
<b>Total</b>	<b>2,616.1</b>	<b>100%</b>

Source Arthur Andersen/AVCAL survey 1997

super funds are compensating for 'gunshy' institutional investors who've "avoided high-tech and biotech venture capital like the plague".

"We need Australian super funds to understand technology venture capital as an asset class," said Finkel, who believes retirement investors are becoming less conservative as they come to understand the benefits of a diverse and balanced portfolio.



# PROVIEW *monitors*

*Out-of-this-world performance & features  
at a very  
down-to-earth price*

ProView's new PX multimedia monitor will let you discover new heights in the modern computing experience. Whether you want to enjoy the cutting-edge graphics an real-time sound of multimedia and the internet, or need the most cost-effective display solutions for your office applications -this monitor is for you.



Our complete line of 15" to 21" monitors assures that you will find just the right model for your particular needs—and budget. Over the years, ProView has built up a solid reputation worldwide for providing top-notch display solutions at an affordable price. With the new PX series and range of XGA LCD Display, we continue this tradition—bringing you the best quality monitors at the most reasonable prices. Check with your local dealer to make your own cost and feature comparison. We're sure you'll agree with us.

## **One Touch Key with OSD**



**NATCOMP**  
IMPORTER & DISTRIBUTOR OF PERSONAL COMPUTERS

AUSTRALIAN SOLE DISTRIBUTOR

**Sydney** 15-17 Bibby Street, Chiswick, NSW 2046  
Ph: (02) 9712 0099 Fax: (02) 9712 0900  
**Brisbane** Unit 1, 16 Nile Street, Woolloongabba QLD 4102  
Ph: (07) 3392 1666 Fax: (07) 3392 1744  
**Perth** Unit 1, 6 Leeway Court, Osborne Park, WA 6017  
Ph: (08) 9446 9959 Fax: (08) 9446 9982

## *Dealer Enquiries Welcome!*

**For more information on ProView Monitors - FAX OR MAIL THIS COUPON NOW to your nearest Natcomp office!**

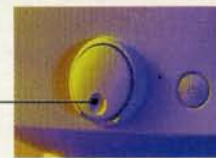
Please send me more information on ProView Monitors today!

Surname \_\_\_\_\_ First Name \_\_\_\_\_

Address \_\_\_\_\_

Postcode \_\_\_\_\_

Telephone \_\_\_\_\_ Facsimile \_\_\_\_\_



### **PX multimedia series**

With its unique and conveniently-positioned multi-function dial, getting your ProView monitor set up exactly as you want it is an easy and intuitive task.



## Capital investment

# Why OzEmail went to Nasdaq first

When top ISP OzEmail cross-listed on the Australian Stock Exchange (ASX) in May, local startups breathed a small sigh of relief. Finally, a homegrown blue chip Internet stock to reassure investors scared by the mauling of Web pioneer Sausage Software.

Public offerings are tough, but they're even harder if the market has no comparable players. That's why OzEmail CEO Sean Howard looked to Nasdaq in the US. Already heavily loaded with Internet and telecommunications stocks, Nasdaq could quickly grasp the company's business model and assess a fair capital valuation. Howard believes Nasdaq's specialised expertise is exerting a "gravitational effect" on high-tech companies worldwide. "It's like bees around a honey pot," he said.

In May 1996, OzEmail made an initial public offering on Nasdaq to raise extra capital for infrastructure and operations expansion. At the time Howard felt an ASX float would have left OzEmail like a "shag on a rock", misunderstood and maligned.

But the public's enthusiastic grab for Telstra convinced him that the time was ripe to leverage OzEmail's brand recogni-

tion at home. After tidying up the important Access One acquisition, cross-listing was basically a matter of preparing the compliance documents. And all of a sudden Australia has the seeds of a technology-aware Internet sector.

OzEmail blazed a trail for Australian IT ambitions, but Howard hopes local entrepreneurs won't always need to look to foreign capital markets. "If you're a company [with] some brand recognition in Australia, particularly in the services area, it's certainly appropriate to look at leveraging off your brand name on the ASX," he said. Nonetheless, Howard still feels Silicon Valley has more advanced structures to guide startup companies down the "well-trodden path" towards IPO rewards.

ANZ Securities analyst Jim Roennfeldt believes OzEmail will eventually make ASX its primary exchange, because wild fluctuations in the Nasdaq stock — which sank as low as \$US5.75 earlier this year before reaching a \$US28.87 high several months later — result more from speculation than informed research. Local listing will become more appealing as the domestic sector emerges. Roennfeldt urges IPO

wannabes to build strong management, and partner with credible strategic investors before approaching conservative Australian markets.

Yet, successful privately-held firms like Mincom, Hypertec, Ipex, Com Tech and Aspect seem permanently stuck in the wings of the ASX. Each generates annual turnover beyond \$100 million, but the downside of listing in a sceptical market seems to outweigh potential benefits. Several early technology stocks failed to meet expectations. Often this resulted from going public too early, but it cemented market cynicism.

Even so, Nasdaq is a very demanding environment. Graeme Browning, head of Ernst & Young's entrepreneur services group in Sydney, pointed out that stringent accounting rules can dampen enterprise software prospects. A recent directive forces software companies to apportion licence revenues over time, rather than instantly booking sales. Australians will need to comply with these rules to impress US financiers, Browning said. Nevertheless, he remains optimistic that Australian companies can achieve the Nasdaq dream.

**Dan Tebbutt**

Blumberg admitted it's hard for politicians to reduce CGT because it appears to help the wealthy. But capital investment is essential to create sufficient jobs in new service and technology industries to counteract long-term downsizing in traditional sectors. As Coopers & Lybrand discovered, venture capital investment equips young companies to expand their employment and profit even faster than the big end of town.

## Rich uncles

Venture capital is not for everyone. One common complaint from startups is that deal sizes are too big for their requirements. Seed capital under a million dollars is almost nonexistent, according to Paul Hinkley, CEO of Meta Innovation, a Melbourne keyboard skills solution developer seeking VC. "It's easy enough to raise development capital — but that's not venture capital. Most [investment] is low-risk development capital for companies that have been in business for up to five years,"

he claimed. Andersen's AVCAL survey reflects Hinkley's concern: expansion capital soaks up 83% of dollars invested, whereas seed funding receives only 2.5%.

But Dawson Johns, an outspoken critic of the Australian VC industry, said most local entrepreneurs usually don't seek enough money to make investment worthwhile. Due diligence costs would be too high to consider backing a domestically focused company, while the US market generally demands such huge investment that it's beyond the risk tolerance of local financiers. In Silicon Valley, according to Blumberg, typical seed valuations increased from \$US1 million in 1992 to \$US5 million by 1997.

"If you want venture capital, go to America," said Johns. Labtam pioneered a range of X terminals (sold to Tektronix) then launched corporate ISP Access One (sold to Solution6, then OzEmail). Johns was seeking VC investment to launch the company's IP-based videoconferencing software in the US, but he has since found a way forward through trans-Pacific part-

nering. "The Government has failed to understand: the problem is not the R&D, the problem is *marketing* the R&D," he added.

Vcs are not the only source of finance for entrepreneurs. 'Angels' (private investors who help out startups) are sometimes sighted in Australia, but Hinkley claims their extreme aversion to risk defeats the purpose of seed capital.

Smart multinationals often have large R&D reserves they'll invest anywhere in the world, according to Blumberg. Samsung, for example, invests several million dollars in Australian IT companies. Current joint ventures include 3D-TV, networking software and ATM. Managing director Patrick Byrne said now is a good time to approach the electronics giant because Korea's domestic crisis is encouraging the company to look further afield. As well as dollars, Samsung offers a worldwide distribution and marketing channel.

Likewise, Intel established Asia-Pacific and European development offices earlier this year to expand its start-up portfolio



# Stop wasting time on the Net

USE AUSTRALIA'S FASTEST MODEM TECHNOLOGY-56K\*

Experience the Internet like  
never before! Grab graphics-  
rich Web pages, e-mail, huge

**3Com Megahertz**

**3Com U.S. Robotics**

data files, real-time sound and  
video faster and play intense  
games. Get more done online.  
Stop waiting for downloads  
and contact us now for your  
nearest retailer.

Phone: 1800 644 606

Email: [3com4info@3com.com](mailto:3com4info@3com.com)

Web: [www.3com.com.au/56k](http://www.3com.com.au/56k)



3Com U.S. Robotics  
56K Voice Faxmodem  
\$259



3Com Megahertz  
56K Global Modem  
PC Card \$375

©1998 3Com Corp. 3Com, Megahertz and U.S. Robotics are registered trademarks and More connected and x2 are trademarks of 3Com Corporation. \*Capable of receiving at up to 56Kbps and sending at up to 31.2Kbps. Actual speeds may vary. Requires compatible analog phone line and server equipment. V.90 standard officially determined in February, 1998, ratification expected in September, 1998.

See [www.3com.com/56K](http://www.3com.com/56K) for details. FCB/3AN9849/APC

**3Com**® More connected.™



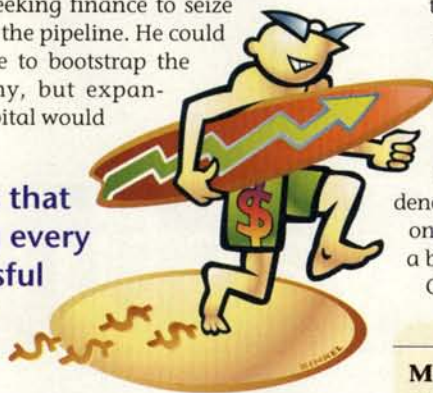
beyond US shores. No Australian investments are on the cards yet, but Singapore-based Jansz is working closely with IIF investors and other industry ties from his time as Intel's Australian general manager. Ideal candidates are startups with unique market position or products and the potential to develop into a viable standalone company. Investment and partnership with Intel is perceived as a fast track to success.

**"The track record in the US shows that exploding onto a market and firing every bullet you've got is more successful than a slow, build-on-success model."**

"If you have a technology and you know it's going to be successful, there's no point just dribbling it out," said Jansz. "The track record in the US shows that exploding onto a market and firing every bullet you've got is more successful than a slow, build-on-success model."

### The VC legacy

Many Australian startups are reaching the end of their tether. "It's tough overseas but at least there is hope. Here there is no hope," said one despairing entrepreneur who's seeking finance to seize deals in the pipeline. He could continue to bootstrap the company, but expansion capital would



pave a more aggressive path towards success.

Johns feels chronic national problems such as the balance of payments shortfall and high unemployment can only be solved by fostering Australian-owned companies that successfully market and sell

high-tech intellectual property into the US. Canberra must provide incentives for company building and retention of Australian ownership. Currently, capital is far more easily found overseas, in Johns' experience, and this is draining our reserves of talent, ideas and technical skill.

All is not lost, though. Blumberg reminds Australia that Israel took only five years to create a VC market larger than all of Europe and with more money per capita than the US. Finding role models will foster confidence and encourage entrepreneurs to hold on and develop ideas. He added: "Luck is a big part of success in this business."

Over to you, Lucky Country. ■

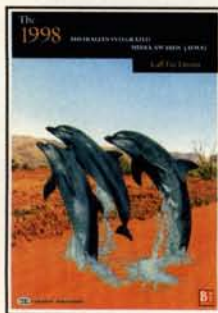
**More on VC on the Web at [apcmag.com](http://apcmag.com)**

**Boys to men:** NDG takes the next step.

**To fab or not to fab:** Selina Mitchell reviews the pros and cons of centralising chip fabrication plants in Australia.

## Your VOTE

in the 1998 AUSTRALIAN INTEGRATED MEDIA AWARDS (AIMA)  
**Could WIN You**  
an Epson Colour Printer



1998 AIMAs brought to you by ACP Computer Publications in association with B&T Weekly.

As a reader of this magazine, you are no doubt familiar with the integration of media - in particular magazine ads directing you to web sites. Which is why we have created a special category in the 1998 AIMAs.

This year ACP Computer Publications will be presenting the first Australian Integrated Media Awards (AIMAs).

These awards will recognise those individuals and companies who have achieved excellence in the integration of traditional advertising with new media.

**ACP Computer Publications**

**READERS' CHOICE:  
BEST INTEGRATED  
IT MAGAZINE  
ADVERTISEMENT**

As a reward your vote will go into the draw for an Epson Colour Printer.

Combining the superior performance of EPSON's PerfectPicture Imaging System and true 1440dpi resolution the EPSON Stylus Photo 700 is the perfect solution for both photographic output and sharp black text printing.

To vote, you simply need to go to the AIMA web site:

<http://aima.acp.com.au/vote>. There you'll find the entry form and competition conditions for the ACP Computer Publications Readers' Choice Award.



**EPSON**

The closing date for your vote is September 25, 1998. The Readers' Choice will be announced on October 22, 1998 when the draw for the Epson Colour Printer will also be held.

**ACP Computer Publications**





# Before you dive in, look into an LG.

You may have thought that, if you wanted the earth's finest computer monitors, you'd have to pay the highest prices.

LG is here to challenge that belief.

Last year, 6 million computer users discovered how much quality LG could squeeze into each monitor dollar.

They discovered that LG's 15" Studioworks monitor, for example, offers features you'd expect to find on a high end professional unit:

- a flat, square tube, for a more lifelike picture;
- non glare screen, for maximum viewing comfort;
- brilliant lifelike colours;
- on-screen display, for the most accurate adjustments;
- some models even include built-in speakers and microphone.

They also discovered that you don't have to splash out as much as you might expect to enjoy a correspondingly superior performance from LG's bigger 17" and 20" monitors too. And that **whichever** one you choose, there's a very reassuring warranty to go with you into the future.

So, before you dive in and buy a new monitor, don't just look into any old monitor – look into an LG.

There's a whole range waiting to impress you at Australia's most progressive computer resellers.



The Face Of The Future

Branch offices: NSW Phone: 02 9888 1311 • QLD Phone: 07 3350 5677  
VIC Phone: 03 9374 1611 • SA Mob: 0417 241 117 • WA Mob: 0417 917 793

LGE047 APC



# A penguin for all seasons

*Linux has rapidly become a popular OS system choice for a new generation. So, if you head in this direction, which path do you follow?* **By James Morris**

**LINUX IS BECOMING INCREASINGLY** recognised as a rival to mainstream commercial products in terms of performance and reliability. While grassroots users have been aware of the potential of this powerful operating system for many years, widespread recognition by IT management, larger software vendors and the media is a relatively recent phenomenon. The availability of professional-quality Linux distributions has contributed to the explosive growth of its hobbyist user base, as well as this recent increase in recognition for the OS.

In broad terms, Linux distributions are a convenient way of packaging the underlying OS together with a selection of applications and system management tools.

Dozens of distributions are available, from minimal utility packages that can fit entirely on a single floppy disk, to sophisticated products aimed at enterprise markets. Prices vary considerably, from virtually free (downloading and installation costs only), to hundreds

of dollars for distributions that bundle commercial software and professional support.

Linux distributions often contain software covered by a range of 'free' and commercial licensing arrangements, which can significantly affect cost and availability.

In this feature we look at what Linux distributions are, examine related issues and present an overview of some of the more popular and interesting distributions available. We aim to provide useful information for determining the best distribution for you, whether it is for self-education or as a hobby, or for building integrated enterprise solutions.

## A little bit of history

As a university student in early 1991, Linus Torvalds had been working with Minix, a Unix clone developed by Andrew Tanenbaum for teaching purposes. Unimpressed by the technical limitations of Minix, Torvalds embarked on a modest project to develop a free OS.

Initial development continued with occasional public discussion taking place in the newsgroup comp.os.minix. From there, the project began to capture the imagination of OS hackers, many of whom closely tracked its development and contributed to its progress. By the end of 1991, a rudimentary standalone OS was born: Linux Version 0.11.

The Linux kernel at that stage was covered by a strict copyright licence devised by Torvalds to ensure that it would always be free. He later replaced this with the more liberal GNU Public License (GPL), which he had come to know well through the use of free GNU tools in actually

creating Linux. The GPL ensured that the Linux kernel would always remain free and able to be readily distributed.

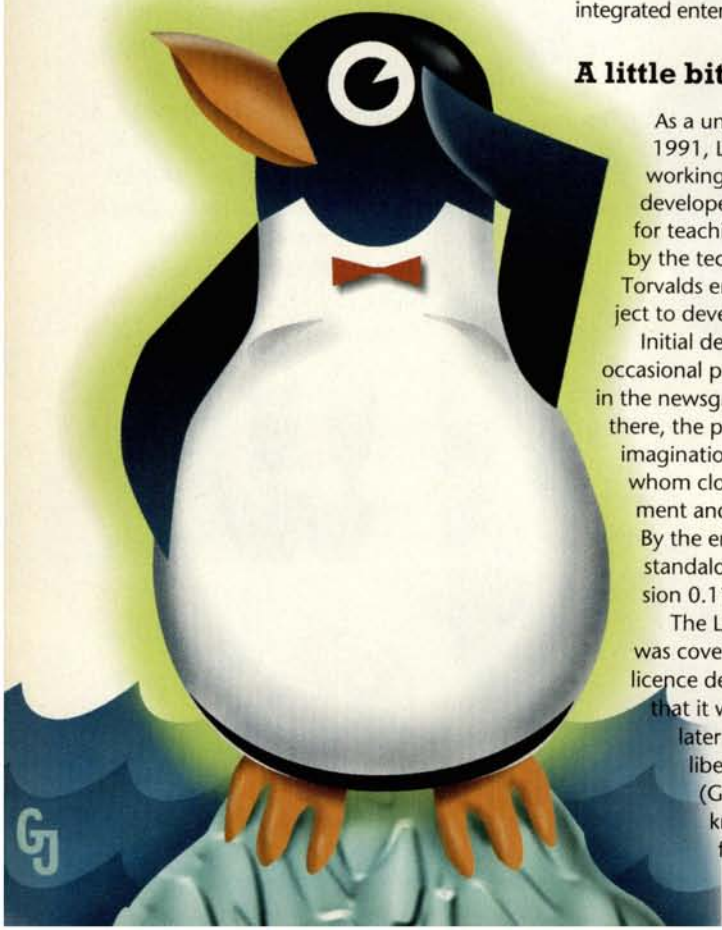
Throughout 1992, Linux evolved rapidly into an increasingly sophisticated OS, attracting a small army of dedicated developers and users. Internet mailing lists and newsgroups facilitated this process, enabling interested people from all over the world to participate. Linux became an important model for the development of an open software project. The GPL distribution terms and use of the Internet as a communications channel were both critical to its success.

Around the same time as the first public releases in 1991 to 1992 the concept of distributions started to take hold. Typically, Torvalds would release 'boot' and 'root' floppy images, along with sources and a number of extra tools which would not fit on the floppy disks. Developers were also furiously porting software to the new OS, which itself was under constant heavy development. The atmosphere was chaotic, and it was indeed quite a task to successfully manage an up-to-date Linux installation in those early days.

Soon afterwards, several attempts were made to consolidate the diverse array of OS components. One of the first of these was undertaken by the Manchester Computing Centre, which produced the MCC Interim Linux in early 1992. This distribution packaged the kernel, utilities and applications together with sources and documentation, providing a useful single point of reference for the growing ranks of Linux enthusiasts.

A new generation of more comprehensive distributions that were easier to obtain and install eventually supplanted MCC and a number of similar early distributions. Notable in this class were the SLS (Soft Landing Systems) and Slackware releases, the latter surviving as an active distribution to this day.

As Linux matured technically, attention was directed towards the issue of system management. While some existing distributions provided useful installation and set-





up scripts, the ongoing maintenance and configuration of a Linux installation presented problems. The growing complexity of the system made it increasingly difficult to perform upgrades and install new software.

By early 1994, a number of new distributions seeking to address system management problems were released. The now defunct Bogus distribution included a rudimentary package management tool with the unfortunate title of PMS (Package Management System). A new, commercially oriented distribution called 'Red Hat' was also released, which later drew on PMS in the development of RPM (Red Hat Package Manager). This year also marked the public beginnings of the Debian distribution, which featured an evolving package management utility known as 'dpkg'.

## Modern distributions

The general quality of Linux distributions has continued to improve in recent years, and development and refinement of system management facilities is ongoing. The underlying kernel and system libraries have also changed significantly; better distributions have kept abreast of new advances in these base components.

Many new users are now already accustomed to GUI environments; this and the increasing capabilities of low-cost consumer PCs have encouraged the effort invested in the development of GUI desktop environments such as KDE and Gnome. Some developers are also driven by the prospect of competing with Microsoft Windows NT, although this is certainly not true of all Linux enthusiasts (Torvalds himself does not see the products as competing).

We are also seeing a variety of commercial influences in Linux distributions, with companies such as Red Hat and Caldera spearheading new economic models in the OS market. Some traditional software vendors are showing strong signs of interest, developing Linux versions of their products. These are often tai-



lored and marketed jointly with commercial distributions as enterprise solutions.

It is also interesting to see the emergence of minimal distributions, which recall the early days of Linux development, and lend themselves to specialised use such as routers and system recovery tools. The number of good non-English language distributions has been steadily increasing, as have distributions specifically aimed at non-PC platforms.

## Anatomy of a distribution

To help gain a fuller understanding of what a Linux distribution actually is, we'll first look at the underlying components of a typical system.

### Base system

At the heart of any Linux system is the kernel, which manages system resources and provides an environment for the execution of applications. The kernel also contains device drivers which deal with hardware and networking components such as the TCP/IP stack.

Layered above the kernel are the system libraries. These act as an intermediary between applications and the kernel, providing a shareable repository of standard utility functions (such as determining the time of day or name of the machine). The application interfaces provided by the system libraries conform to a variety of standards for Unix systems, and are the basis for application portability between different types of Unix.

Typically, a number of specialised libraries are also present, providing common code for use by higher level applications such as GUIs.

The next layer up contains the shell and standard Unix utilities. In simple terms, the shell interprets user commands and executes them either as built-in functions or external programs. Standard utilities include basic commands for manipulating objects such as disks and files, and for the general running of the system.

These standard components, which are generally available free under the GPL or similar licences, make up the basis of a typical Linux System.

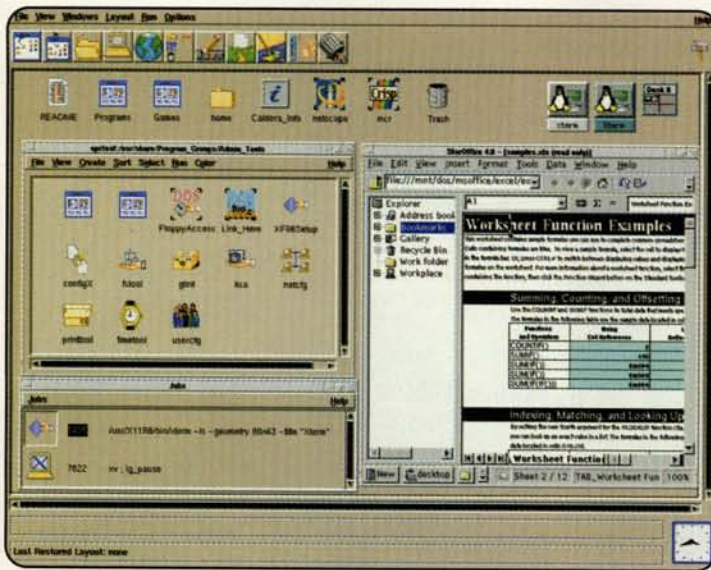
Most distributions are therefore built on a free, widely available base. The main differences between distributions lie in the way these components are laid out and integrated. For example, good distributions tend to ensure that the latest kernel, libraries and utilities are available, while also taking care to address problems which may arise through the use of bleeding-edge components.

### High-level components

Beyond the base system, the other kinds of components in a distribution depend largely on the purpose of the system, and may include some of the following.

- GUIs and desktop environments
- Productivity and office software
- Networking applications
- Specialised server applications
- Databases





Caldera's Looking Glass desktop environment.

- Comprehensive development tools
- Network management products
- System management software
- Security tools
- Extensive documentation
- Multimedia software
- Games

Most of the popular general-purpose distributions provide packages in these categories. However the selection, scope and packaging of these components is where we start to see major differences between the distributions.

Many of these components are of course available free, although this is one of the areas in which commercial vendors may significantly differentiate themselves. In some cases, such as word processors, commercially available packages are generally regarded as being superior to the equivalent free products (for the moment, at least).

There is also scope to include products aimed at providing integration with other commercial systems. This may mean maintaining a standardised desktop environment across the enterprise, or integrating with proprietary networking services. Some commercial vendors are also investing directly in the development of free software. This adds value to their own distribution as well as contributing to the greater Linux community.

In contrast to the new economic models being forged by commercial vendors, there seems to be a groundswell of support in the free software movement. In keeping with the original aims of the development of the Linux kernel itself, groups such as the Debian community continue to work towards the goal of a totally free OS envi-

ronment. And as you will see further on, the results so far are quite impressive.

## Caldera OpenLinux 1.2

Marketed as a solution for business, Caldera OpenLinux Base is a commercial distribution featuring an integrated desktop environment and comprehensive system management facilities.

Caldera, founded by former Novell CEO Ray Noorda, has pioneered the development of relationships between Linux vendors and larger commercial software companies such as Netscape, Corel, Novell and StarDivision.

OpenLinux Base is the foundation of a commercial product line aimed at meeting the networking and OS business. Included with the Base package is a 240-page *Getting Started Guide* and addendum, two CDs of software, an installation floppy, and a number of marketing sheets offering modest discounts on third-party commercial products.

Installation is smooth, starting with a boot from the supplied floppy or primary CD. A menu-based utility called LISA (Linux Installation and System Administration) is employed for the bulk of the set-up procedure, which is simple and quick. Installation settings can be saved to floppy, enabling the same configuration to be rolled out to multiple computers. Network configuration via bootp is supported, and the set-up program can probe for network services such as printers. X Window configuration is managed by a great GUI-based tool called XF86Setup.

Software packages are managed by

RPM, while console-based system administration may be carried out with LISA. Under X Windows, the default window manager is fwm. A very sophisticated desktop environment called 'Looking Glass' is also provided; it sits above the window manager. Looking Glass is similar to Common Desktop Environment (CDE) in that it provides a tightly integrated GUI system for working with the computer. While it is powerful and packed with many cool features, using Looking Glass means learning yet another proprietary interface. Perhaps in recognition of this, Caldera recently announced that the next version of OpenLinux will ship with KDE as the standard desktop environment.

Included with the Base package are a number of commercial products, including the Metro-X server, a Novell NetWare client, the CRISPlite text editor and the BRU2000-PE backup system. A version of StarOffice, with a 'non-commercial licence', is also provided. This is a highly professional office productivity suite which reads and writes files in a number of Microsoft Office formats, and is well worth a try.

Caldera also sells a variety of useful commercial add-ons including Adabas-D SQL database server, Netscape Fast-Track Web server, and Wabi, which allows a selection of major 16-bit Windows applications to be run under Linux.

An evaluation version of Caldera's new NetWare for Linux server is available for

download from the Web site (see table, page 102), which will form part of a new small business server product to be released later this year.

At around \$110, OpenLinux Base is a relatively expensive Linux distribution, although it is very well suited to enterprise use. It is still significantly cheaper than mainstream commercial OSes.

After an initial 30 days (or five instances) of free support, a variety of commercial support options are available, including services provided by local business partners.

Caldera is known for being very prompt and professional in its responses to queries; this creates the kind of confidence that is

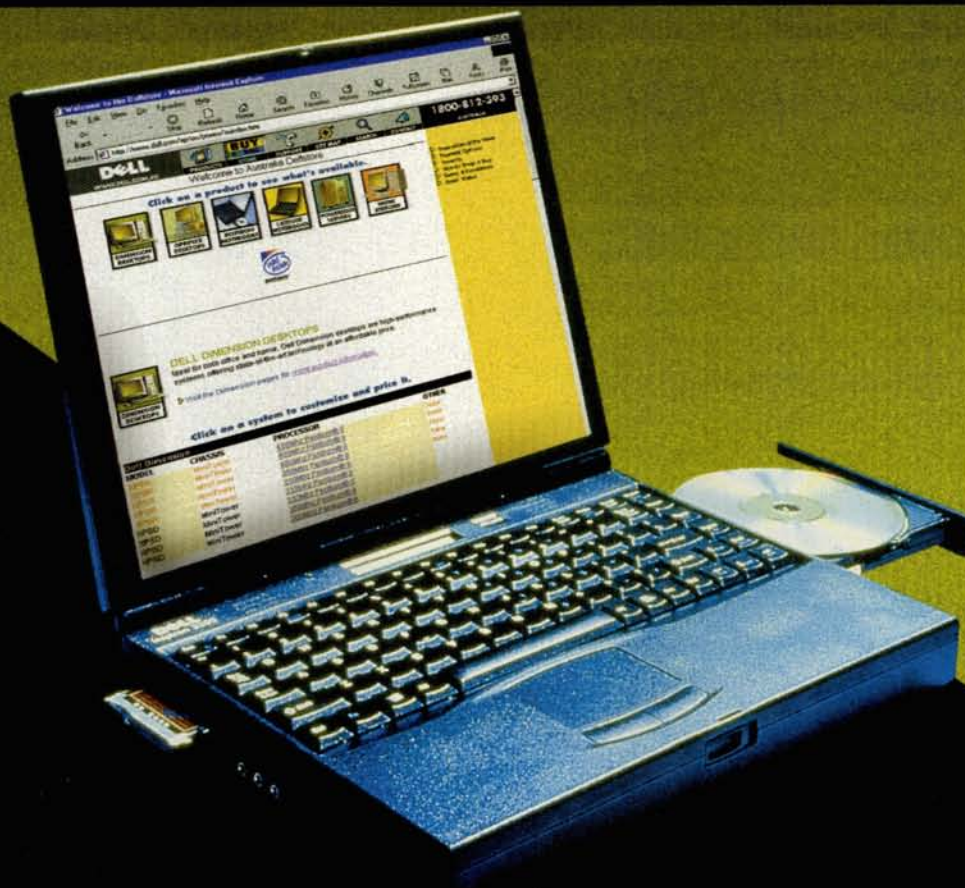




# THE SOLUTION TO PERFORMANCE ANXIETY.

If you think high-performance notebooks only come at a high price, relax.

**Dell® Inspiron® 3200 Notebook has got it all.**



## DELL® INSPIRON® 3200 D266XT

- Intel® Pentium® II Processor 266MHz
- 512KB L2 Pipeline Burst Cache
- 32MB SDRAM
- 3.2GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 128-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X CD-ROM Drive
- 13.3" XGA Colour TFT Display
- Microsoft® Windows® 98
- 56K Data/Fax Modem
- Deluxe Carrying Case
- 1 year limited warranty

**\$4,729\***

or \$41 per week\*\*

Upgrade options: to 4.0GB Ultra ATA Hard Drive \$132, from 32MB to 64MB SDRAM \$113

## DELL® INSPIRON® 3200 D233XT

- Intel® Pentium® II Processor 233MHz
- 512KB L2 Pipeline Burst Cache
- 32MB SDRAM
- 3.2GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 128-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X CD-ROM Drive
- 13.3" XGA Colour TFT Display
- Microsoft® Windows® 98
- Deluxe Carrying Case
- 1 year limited warranty

**\$4,079\***

or \$35 per week\*\*

Upgrade options: 56K Data/Fax Modem \$282, Second Battery \$263

## DELL'S WIRED!

You can custom-configure Dell PCs to your exact requirements with the latest technology at great-value prices – even order and make payment via our credit card secure WebStore! It's open 24 hours a day, so try it for yourself. We are constantly revising our prices and offering new products. Call today or visit our Web site for our latest product and price offers.

Visit [www.dell.com.au](http://www.dell.com.au)

## CALL DELL

Call Dell today, Mon-Fri 8am-8pm, Sat 9am-3pm (EST).



**1300 303 142**

OR VISIT [www.dell.com.au](http://www.dell.com.au)

\*Prices and specifications subject to change without notice. All prices shown include tax and delivery is additional. Certain configurations can not be changed. Dell, the Dell logo are registered trademarks, and Inspiron is a trademark of the Dell Computer Corporation. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. Microsoft, Windows 98 are registered trademarks of Microsoft Corporation. Other trademarks and trade names may be used in this document, refer to either the entities claiming marks and names or their products. Dell disclaims proprietary interest in the marks and the names of others. Dell is not responsible for errors in typography and photography. Photographed with options. For a complete copy of Dell's limited-warranty offerings please write to Dell Computer Pty Ltd, Building 3, 14 Aquatic Drive, Frenchs Forest, NSW, 2086. \*\*Dell Financial Services offer rentals based on a 36 month term excluding stamp duty and FID which varies from state to state. Rentals and operating leases are available only to approved registered sole traders, partnerships and companies. Figures shown are indicative and may vary with interest rates. Copyright 1998 Dell Computer Corporation. DEL00032/APC/INS All Rights reserved.





## BEST DISTRIBUTION

## ● Red Hat Linux 5.1 (Intel PC)

Red Hat Linux shines as a powerful, richly featured operating system.

Capable of filling virtually any role from personal workstation through to mission-critical network server, Red Hat Linux provides high levels of dependability and flexibility.

With its slick installation procedure and easy-to-use, comprehensive system management features, Red Hat Linux is suited to the widest range of users.

The software particularly stands out thanks to continued refinement of features such as the Kickstart installation facility, and the efforts taken to simplify some of the more difficult aspects of running Linux.

## MOST PROMISING DISTRIBUTION

## ● Debian GNU/Linux 2.0

Debian GNU/Linux is a very high-quality distribution, with an extensive selection of carefully prepared software packages.

Great care has also been taken in the general layout and integration of the system, the integrity of which may be maintained with advanced package management facilities.

Debian is slightly more difficult for a non-technical user to manage than Red Hat.

## HIGHLY COMMENDED

## ● Caldera OpenLinux 1.2

Caldera OpenLinux 1.2 is a highly capable business-oriented product.

The distribution is well conceived in terms of usability, and provides a solid foundation for the deployment of a wide range of network-based services.

Caldera's recent release of the Linux NetWare server, and the increasing availability of high-quality commercial software applications such as StarOffice point to a promising future for OpenLinux as a sophisticated business tool.

often required in convincing businesses to move to Linux.

## Debian GNU/Linux 2.0 Beta

One of the problems with early Linux distributions such as SLS and Slackware was the workload they imposed upon those maintaining them. The kernel itself was still undergoing rapid change, and high-level components were growing both in number and complexity.

The Debian Linux distribution was conceived to address this problem, by using a volunteer development model similar to that used by Torvalds in the creation of the kernel itself. This has spread the workload more evenly throughout the Linux community. It has also provided Linux enthusiasts with the opportunity to participate closely in the development of the distribution.

Today, Debian Linux is the result of cooperation between over 300 volunteers working towards producing a professional, free OS. Much of the effort is coordinated via Internet mailing lists and IRC (Internet Relay Chat) channels. While this may seem like a recipe for disaster, the strong sense of community and dedication to the ideal of free software provides a unifying force.



At the time of writing, Version 2.0 of the Debian distribution (codenamed 'Hamm') was being finalised. Development had been frozen, and fixes to release-critical bugs were the only changes being allowed. For this article, we previewed a beta copy of the distribution which is expected to be very close to the official release.

While the full Debian Linux distribution is made available freely via FTP, it is probably best to try to locate a version on CD-ROM. These are often available at a nominal cost from user groups and resellers, or as

part of a commercial package distributed with printed documentation.

The easiest way to begin installing Debian is to boot directly from the CD, if supported by the system. If not, another simple option is to run a supplied batch file from DOS which uses loadlin to boot into Linux. It is also possible to create a set of installation floppies if needed. Once booted, the

system will immediately require a local source of kernel modules, which may be located on floppies, hard disk or CD. Next, a base system may be loaded from either local media or NFS. Finally, the remaining packages may be installed via FTP in addition to these mechanisms.

The set-up program used during

## Non-PC distributions

Linux is a portable operating system, with fully featured commercial distributions available for the Intel PC, Digital Alpha and Sun SPARC platforms. More than 25 projects aimed at porting Linux to other platforms are also under way. Here are some examples:

## ARM Linux

<http://www.arm.uk.linux.org/~rmk/>

A version of Linux for ARM-based systems such as network computers and PDA devices.

## LinuxPPC

<http://www.linuxppc.org/>

LinuxPPC is a popular distribution supporting PowerPC systems such as the Power Macintosh, BeBox and PowerStack.

## Linux SGI

<http://www.linux.sgi.com/>

The Linux SGI project aims to bring Linux to the full range of SGI platforms,

enabling Linux to take advantage of powerful graphics, multimedia and general high-performance capabilities. Currently, an impressive port of Red Hat 5.1 (called Hard Hat 5.1) is in prerelease for the SGI Indy.

## MkLinux

<http://www.mklinux.apple.com/>

MkLinux is a cooperative effort between Apple Computer and The Open Group aimed at porting Linux to Power Macintosh platforms. The distribution is available freely via FTP from <ftp://ftp.mklinux.apple.com/>.

## UltraPenguin


<http://sunsite.mff.cuni.cz/linux/ultrapenguin-1.0/>

UltraPenguin is a project directed at porting Linux to the high-powered Sun SPARC Ultra I and II platforms. Enterprise class systems are not fully supported at this stage.



The colour inkjet  
that breaks the speed barrier.



Combining fast colour and true-black text printing with 1440dpi resolution (even on plain paper)  
EPSON STYLUS COLOR 850 the EPSON STYLUS COLOR 850 is the high performance colour inkjet for all your business needs.  
It features EPSON's PerfectPicture Imaging System for Photo Quality output as standard and print speeds rivalling personal  
desktop laser printers\*. It's equipped with parallel and serial interfaces for PC and Mac™ and has a variety of optional interfaces  
for easy networking. What's more, with the optional StylusRIP software it can be converted into an affordable PostScript printer giving you THE POWER TO CREATE. **EPSON®**   
SYDNEY (02) 9903 9000 MELBOURNE (03) 9685 6555 BRISBANE (07) 3360 0219 PERTH (08) 9480 0418 [www.epson.com.au](http://www.epson.com.au)

\*Black text printing only. EPS 0247 The Hale Agency



installation is quite sophisticated, providing a main menu of tasks to be completed and prompting as to the next logical step. An area at the top of the screen is used to display useful, context-sensitive information about each stage of the installation. While the installation procedure is flexible and generally well conceived, it is perhaps not as simple as that of Red Hat.

What is striking, however, is the general layout and integration of the system. Debian is a truly elegant Linux distribution; great care has been taken in the preparation of packages and their placement within the system. The sheer number of packages available is also impressive; around 1,800 are ready for the Hamm release. This version of Debian also upgrades the system libraries to the new libc6, and much effort has been invested in ensuring that this transition is as smooth as possible.

Underlying the success of Debian in producing a well-integrated system is dpkg, a powerful package management utility. It allows developers to construct software packages which conform to Debian development guidelines, and provides users with an efficient, robust system for managing software. Services such as Web servers may be upgraded on the fly with dpkg, which will stop the service, install the new software, then restart it automatically.

A menu-based management tool called 'dselect' extends the functionality of dpkg by providing an interactive and highly informative interface to packages. While some users find dselect difficult to use, it is really just a matter of reading the instructions beforehand, and noting the status messages produced while running. A small investment of time in learning to utilise dselect is invaluable in maintaining the system. A new, GUI-based package called 'apt' is under active development, promising a friendlier interface and technical advances. While not expected to be fully completed until the next release of Debian, working beta versions are available now from the FTP archives (see <http://www.debian.org/> for further information).

While an enormous amount of documentation and other resources are available at the Web site, it may be worth investing in a CD package, which includes printed documentation. Linux Press produces a handy 270-page user's guide, bundled with Debian CDs. In keeping with the open nature of the Debian project, the guide is also available free on the Web in HTML format (see <http://www.linuxpress.com/>).

## How we tested

In preparing this article, we installed and ran all of the major distributions for the Intel architecture. The test machine was a Dell Optiplex GXMT 5166 using a Pentium 166MHz CPU, 48M of RAM, an S3-based 2M video card, and a 2G IDE hard drive, and a 3.5G SCSI hard drive coupled with an Adaptec AHA-2940UW controller.

Distributions were evaluated on the following subjective qualities:

- Functionality and usability of installation
- General system layout
- Quality and range of packages
- Functionality and usability of system management facilities
- Availability

- Suitability for use in a range of situations from workstation to network server
- Support

Considering the high quality of Linux development in these distributions, performance benchmarks aren't required. All these distributions will perform equally due to the base Linux components from which they are all derived. Some distributions have newer kernel versions, which often means a slightly larger feature set is available, but the performance difference between versions is negligible.

The table on page 102 summarises the important features and their comparative values.

Efforts are also under way to port Debian Linux to non-Intel architectures; the m68k port (Atari, Amiga, Mac) is expected to be ready for the final release of Hamm. Similar ongoing projects include ports to the SPARC, Alpha and PowerPC architectures.

While not receiving the same level of attention from the mainstream media as some commercial distributions, Debian Linux is a solid, comprehensive product, and a genuine pleasure to use. It is also great to become involved with the Debian collective, whose friendliness and spirit recalls the early days of the Internet and its sense of openness and global cooperation.

### Red Hat Linux 5.1

As one of the most popular and well-known Linux distributions, Red Hat Linux is the impressive culmination of more than four years of concentrated development and refinement.

Starting with the simple aim of making Linux easier for people to install and use, the developers at Red Hat Software have produced an extensive, well-integrated distribution with powerful system management facilities.

Historically, one of the biggest hurdles for new Linux users has been in the initial installation. Red Hat's installation procedure is a snap.

Utilising the modular nature of recent kernels, most Red Hat installations can be managed with a single boot floppy. Device drivers for specific hardware components are then loaded as modules from

the installation media as required. In some cases a supplementary installation disk will be required, such as when installing from a PC Card-connected CD-ROM.

The installation procedure is also very flexible, featuring support for installation via CD-ROM, FTP, NFS (Network File System), SMB (Server Message Block, Microsoft networking) and local hard drive. Automated unattended setup is supported through the Kickstart facility, which supports dynamic network address allocation via bootp and DHCP.

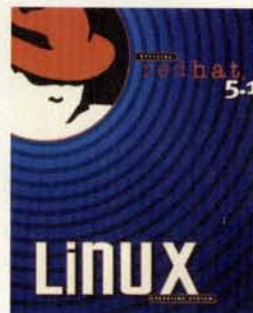
After selecting the installation method — probably the default for most users, which simply involves pressing the Enter key — a small Linux system is loaded into memory and a set-up program is launched.

The set-up procedure has been revamped for this latest release and now features support for a variety of languages,

including an amusing 'Red-neck' dialect. Most of the set-up stages now include a Back button, helping to simplify the installation process.

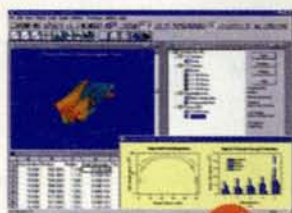
Another area that often causes problems is in the management of disk partitions. Red Hat Software is addressing this issue through the development of a disk management package called Disk Druid, which is offered as an alternative to fdisk during installation. Disk Druid certainly looks promising, however many users may find it more comforting to stick with the less friendly but well-travelled fdisk option.

Following disk partitioning and file-





# The Essential Desktop for Scientists and Engineers



**SigmaPlot**  
**FLEXIBLE SCIENTIFIC GRAPHING**  
From nonlinear regressions to multiple axes per graph, nearly 100 000 researchers depend on award-winning SigmaPlot's flexibility and power to analyse and graph their technical data the way they need to.

NEW 4.0 VERSION



**SigmaStat**  
**ADVISORY STATISTICAL SOFTWARE**  
It's like having a professional statistical consultant at your fingertips. SigmaStat advises on the test to use, checks for violations in underlying assumptions, explains the results, and handles messy data.



**SigmaScan Pro**  
**IMAGE ANALYSIS**  
Measure, count and transform your digital images quickly and accurately. SigmaScan Pro provides more advanced image analysis capabilities than dedicated imaging systems at a fraction of the cost.

NEW 4.0 VERSION



**SYSTAT**  
**UNPARALLELED RESEARCH QUALITY STATISTICS AND GRAPHICS**  
(Mac version available)  
The complete package for serious research. With SYSTAT's extensive library of integrated statistics and graphics, you'll never have to worry about finding the right statistic or graph to meet the specific needs of your research.

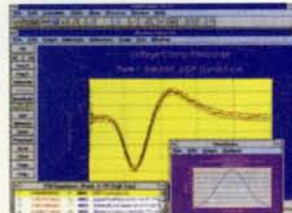
NEW 7.0 VERSION



**Mathematica**  
**QUICK, ACCURATE NUMERIC AND SYMBOLIC SOLUTIONS**  
Mathematica is ideal for creating interactive technical reports, presentations and courseware that include text, active formulas, graphics and customisable buttons and palettes. A growing library of application packages provides specialised capabilities for different needs.



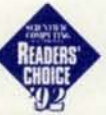
**Mathcad**  
**ENVIRONMENT FOR TECHNICAL CALCULATIONS**  
Mathcad's interactive, free-form, visual interface makes it easy to set up, analyse, solve and document all kinds of technical problems, using real mathematical notation which you can integrate on-screen with text and graphics.



**TableCurve 2D**  
**TableCurve 3D**  
**AUTOMATED CURVE FITTING**  
Both programs save you weeks of trial and error data fitting by searching through thousands (2D) or millions (3D) of equations to find those that best fit your data. Find the best model for your data in seconds with TableCurve!



**Deltagraph**  
**FOR COMMERCIAL PUBLICATION**  
(Mac version available)  
Provides 60+ scientific, business and technical charts, extensive data import and linking capabilities, chart template libraries, chart adviser and slide show capabilities. Huge range of 2D and 3D chart types and sophisticated slide show feature.



**Hearne**  
Scientific Software

Level 6, 552 Lonsdale Street, Melbourne 3000  
Phone: 03-9602-5088 Fax: 03-9602-5050  
Email: info@hearne.com.au WWW: www.hearne.com.au



**freecall: 1 800 35 STAT**



## Specialised distributions

Linux is the Swiss Army knife of operating systems. With a robust and increasingly modular kernel, it is able to meet a diverse range of computing needs, from embedded systems through to high-end network servers.

While most users will find that at least one of the major distributions is suited to their requirements, a fascinating array of specialised distributions are also available. The following list is a selection of these, with a focus on specialised distributions relevant to the Intel PC architecture.

### DLX

<http://gd.tuwien.ac.at/pub/opsys/linux/DLX/dlx.html>

DLX is a Linux distribution that fits entirely on a floppy disk. It has a small writeable file system of about 130K and is useful in troubleshooting network and hardware problems.

### Extreme Linux (Beowulf Project)

<http://www.extremelinux.org/>  
<http://cesdis.gsfc.nasa.gov/linux/beowulf/beowulf.html>  
<http://www.redhat.com/extreme/products.html>

Extreme Linux is a Red Hat-based distribution, developed by NASA for the Beowulf Project, which explores the possibilities of clustered, low-cost computers working in parallel to form high-performance systems. Extreme Linux is available via FTP (see above Web sites), or on CD for around \$35.

### DOSLinux

<http://www.tux.org/pub/people/kent-robotti/>

DOSLinux is a small (40M) UMSDOS-based package that can be installed on existing DOS/Win 9x systems. This allows Linux to be run without having to re-partition the system disks.

### Hal91

<http://home.sol.no/~okolaas/hal91.html>

Hal91 is another minimal Linux system that fits on a single floppy, intended for use in system recovery situations.

### IronWing

<http://www.lizard.org/dragonlinux/ironwing.html>

From the developer of FireMyst, IronWing is a larger distribution (25M) aimed at providing a simple way to use the Internet with Linux. A UMSDOS package, IronWing can be installed on an existing DOS partition then loaded as needed. IronWing includes Lynx for browsing the Web, while other network applications, such as IRC clients, may be installed from FTP sites with RPM.

### Linux Router Project

<http://www.psychosis.com/linux-router/>  
 The Linux Router Project (LRP) is an impressive effort aimed at utilising Linux as a specialised network operating system. Small enough to fit on a single floppy, LRP may be used to build routers, firewalls and terminal servers. LRP supports a huge range of networking protocols, and is able to supply SNMP statistics for integration with monitoring systems. A must-see for any network administrator.

### muLinux

<http://www4.pisoft.it/~andreoli/mulinux.html>

muLinux is an amazing single-floppy distribution with support for networking, printing, modem connectivity, email, Web browsing and sound playing. It can also access DOS, Windows, NFS and CD-ROM file systems.

### tomsrtbt

<http://www.clark.net/~toehser/rb/>  
 Claiming to be "the most Linux on one floppy disk", this distribution contains a selection of useful tools, and is primarily intended for use as a rescue disk.

system creation, the intended purpose of the system may be selected from a list of common configurations, such as Web Server or Networked Workstation. This generates a list of suggested packages to be installed, which may be further tailored as necessary. A full installation of all packages may also be selected, requiring around 700M of disk space. This may be a

good option for home users who have the space available, and want to get a real feel for the system.

The set-up program then moves into a configuration phase, starting with identification of the system mouse. The next step is X Window configuration, a common source of problems. Red Hat utilises Xconfigurator, a screen-based tool that helps to

streamline the process. If not already configured for remote installation, a series of dialog boxes then facilitate network configuration, followed by time zone selection. A handy menu of system services to be started at boot time is then presented, followed by comprehensive printer configuration. The initial root password for the system is set, and the option of creating a boot disk is provided. Finally, LILO may be configured as the system boot loader if required.

This is a very polished set-up process, which may take as little as 10 minutes for an experienced user. It certainly beats NT 4.0's reboot-a-thon installation hands down.

Once up and running, the system may be further managed through the use of a range of screen-based configuration tools, or via the Red Hat Control Panel under X Windows. A selection of soundcards may be configured dynamically under Red Hat through the use of specially modified modules and a configuration utility called snd-config. This greatly simplifies a task which previously required recompilation of the kernel. Also included with the latest release is linuxconf, a very comprehensive and powerful system configuration application with command line, screen, X and Web interfaces.

RPM helps with the maintenance of the distribution. It provides a reliable means for installing, updating, querying and verifying software. RPM is aware of dependencies between packages, helping to ensure the overall integrity of the system. Users ranging from hobbyists through to professional administrators should find RPM an invaluable tool for maintaining systems.

A sophisticated graphical front end to the RPM system called 'Glint' is also provided. Utilising the Tcl/Tk graphical widget set for the user interface, Glint groups packages into logical categories for easy navigation and management. Glint as released in Red Hat 5.1 was a little buggy. A fix is now available from the errata section of <http://www.redhat.com/>.

The general user environment is well laid out, with substantial documentation and a good selection of software packages. Significant improvements have been made to the default X configuration, with the inclusion of the AfterStep window manager. fvwm95 is still the default window manager, which will suit many users, but can be changed to something more tasteful with a couple of mouse-clicks.

The official distribution is available commercially as a boxed set containing binary



# Superior performance Modems and Motherboards now available from Optima

**WebSurfer**

Link up with a Websurfer  
internal or external modem!



- V.90 Upgradable
- Austel Approved
- 5 Year Warranty
- Anti-Static Coding
- Best Quality Components

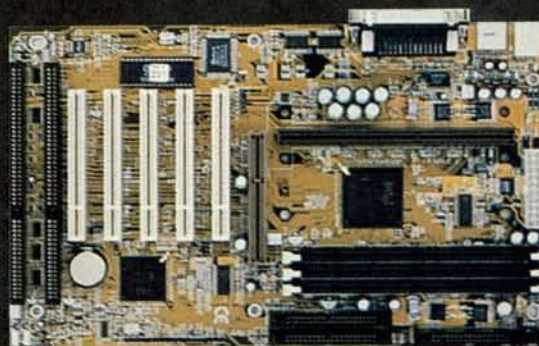
**TAIKOM**  
DATA SYSTEMS CO., LTD.



**ELITEGROUP**

It's the quality components in  
our motherboards that make  
the difference

- 100MHz Host Bus Support
- PC/100 SDRAM Spec. Support
- 68.5 External Bus



P6 BX - A+



**OPTIMA**  
OPD DIVISION

To find out more call:

**(02) 9841 2777**

48A Egerton Street, Sliverwater NSW 2128

**DEALER ENQUIRIES WELCOME**



## Free distributions

Linux distributions are available in many forms. In addition to 'official' products, distributions are often bundled with books and repackaged into CD sets by VARs (value-added resellers).

CD sets created by VARs are typically packed with the freely distributable portions of major distributions, along with mirrors of popular freeware sites. Sometimes termed 'shovelware', these CDs are often quite cheap and can provide good value.

Of the myriad VAR distribution sets, many of which are quite severely outdated, the following have proven to be popular, and may be worth considering:

### Infomagic Developers Resource

<http://www.infomagic.com/>

This six-CD set contains the latest versions of Red Hat, Slackware, SuSE and Debian. This is probably the best way to obtain Slackware on CD. Netscape Communicator and a quick start guide are also included.

and source CDs, an installation floppy disk and a 300-page installation manual. Commercial goodies provided with the boxed set include the BRU2000-PE backup suite, and RealAudio/RealVideo client and server products.

An accompanying applications CD contains an interesting selection of third-party commercial software applications, allowing users to sample the increasing number of commercial products now being made available for Linux. Red Hat itself markets a variety of commercial add-ons, including CDE, Motif 2.1 and the Applixware office suite.

The bulk of the distribution is also available as a free download from the Red Hat FTP site and numerous mirrors (see the Web site for further details). Purchasers of the official distribution also receive 90 days' installation support via email or fax, and a Red Hat sticker. Distributions for the Alpha and SPARC platforms are also available.

Red Hat Linux is a strong leader in commercially oriented distributions, offering slick installation and comprehensive system management facilities. It is well suited to home/hobbyist users, developers, and for IT engineers building solutions for the enterprise.

### Cetus Technology Red Hat GPL CD

<http://www.cetustech.com.au/>

Known as a reliable source of well-priced Linux distributions for many years, Sydney-based Cetus Technology has recently begun producing low-cost Linux CDs. Currently on offer is a \$10 CD containing the freely distributable components of Red Hat 5.1, Red Hat errata, and a selection of newly released versions of large freeware packages such as Gimp and Gnome.

### Linux System Labs Australia

<http://www.lsl.com.au/>

LSL produces a wide range of low-cost CDs, which include the freely distributable components of most major distributions.

### PHT TurboLinux

<http://www.turbolinux.com/>

TurboLinux for the PC is a nicely customised version of Red Hat, while a recently released PowerPC version combines the efforts of the MkLinux and LinxPPC projects.

## Slackware Linux 3.5

Developed by Patrick Volkerding, Slackware has had a long history in the evolution of Linux distributions. It was one of the first to provide a comprehensive range of software packages, and led the way for some time.

The latest version, Slackware Linux 3.5, updates the distribution with the latest stable kernel, the egcs compiler and a number of miscellaneous upgrades.

Normal installation still requires the selection and creation of a boot floppy

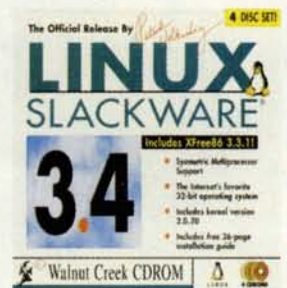
from a list of images with varying kernel drivers built-in, then the selection and creation of a suitable root installation floppy. Once booted, the partitions are configured with fdisk, then the set-up program must be launched manually. An installation menu then guides the user through disk formatting and mount designation, source media selection (CD, local hard disk or NFS), disk set selection, package installation, system and network configuration, and LILO installation. It is a relatively simple and effective way to install the system, however it does require a reasonable knowledge of Linux and may not be for everyone.

An installation method called ZipSlack is also available, which allows for a 77M archive to be installed from a Zip drive (or other suitable media) onto a DOS drive for use as a UMSDOS system.

Once thought of as a huge distribution, Slackware now seems quite minimal, and the range of packages supplied is lacking in comparison to other major distributions. A full installation might take up around 300M of disk space, while a small system with just the base and network components may use as little as 28M.

A series of screen-based scripts facilitate ongoing system management, although the package installer, pkgtool, is not aware of dependencies between packages.

While Slackware could be very useful as a simple base distribution for building specialised systems, the lack of a comprehensive package management system would lead to ongoing maintenance problems.



## New developments

As APC went to press, a number of newer distributions were under development, including:

### SEUL

<http://www.seul.org/>

The Simple End User Linux project aims to increase the accessibility of Linux through the development of a high-quality, free distribution that is easy for non-technical people to use.

### Stampede

<http://www.stampede.org/>

Stampede is a distribution aimed at meeting the needs of both power users and newcomers, and is currently in beta release.

### Eonova Linux

<http://www.eonova.com/>

The goal of this distribution is to ensure an installation's integrity and stability through careful package management.





# See why Australian Personal Computer voted the new AcerView 79g Editor's Choice\*



Better colour, sharper text and the highest refresh rate in its class are just three of the reasons. ■ There are many more.

■ Like its Mitsubishi Diamondtron® CRT with a 0.25mm superfine pitch resolution for superior picture quality. ■ Maximum resolution 1600 x 1200. ■ Plug 'n' Play. ■ A full 16 inch viewable area. ■ And compliance with TC095 ergonomic energy, ecology and emission requirements. ■ The new AcerView 79g monitor brings you brilliant Acer quality - to show your work at its best.

For more details please visit our Website at [www.servex.com.au](http://www.servex.com.au), e-mail us at [servex@acer.com.au](mailto:servex@acer.com.au) or contact your nearest Servex distributor.

**NSW** • Best Byte (02) 9436 0788 • Z-TEK (02) 9557 7299 **VIC** • Canda International (03) 9574 8623 • Z-TEK (03) 9388 1300 **QLD** • Intermedia Computer (07) 3369 0477 • Compuworld Computer (07) 3846 7588 **WA** • Trinx Computers (08) 9351 8799 • Compuwholesale (08) 9474 3655. **SA** • Computers 4 You (08) 8447 2777

\* Australia Personal Computer, February 1998

SVX 789 APC



**ACER MONITORS**  
VISIBLE VALUE

Servex Australia Pty Ltd  
Exclusive Distributor



## Linux distributions at a glance

Distribution	Caldera OpenLinux 1.2	Debian GNU/Linux 2.0 Beta	Red Hat Linux 5.1	Slackware Linux 3.5	SuSE Linux 5.2
Pricing (approximate prices at time of writing)	Base boxed set \$110; other versions range from \$10 to \$369; Lite version available free via FTP	CD sets \$10 to \$60; full distribution available free via FTP	Official boxed set \$55; free components available via FTP	CD set \$50; full distribution available free via FTP	Boxed set \$52; full distribution available free via FTP
Web site	<a href="http://www.caldera.com/">http://www.caldera.com/</a>	<a href="http://www.debian.org/">http://www.debian.org/</a>	<a href="http://www.redhat.com/">http://www.redhat.com/</a>	<a href="http://www.cdrom.com/">http://www.cdrom.com/</a>	<a href="http://www.suse.com/">http://www.suse.com/</a>
Support	30 days/5 instances free support; extra support available from vendor or business partners; general resources at Web site	Support available from resellers and consultants; over 40 mailing lists; IRC channel; extensive resources at Web site	90 days' free installation support; extra support packages available; 19 mailing lists; general resources at Web site	Some resources such as contributed packages available at FTP site ( <a href="ftp://cdrom.com">ftp://cdrom.com</a> )	60 days' free installation support; extra support available from vendor; mailing lists; general resources at Web site
Kernel/libc	2.0.33/libc5	2.0.34/libc6	2.0.34/libc6	2.0.34/libc5	2.0.33/libc5
Ease of installation	★★★★	★★★★	★★★★★	★★	★★
System management	★★★	★★★★	★★★★	★★	★★★
Package range and quality	★★★	★★★★★	★★★★	★★	★★★★
System layout	★★★	★★★★	★★★★	★★	★★★
Overall rating	★★★★	★★★★☆	★★★★☆	★★☆	★★★☆

Apart from its sheer simplicity, it is difficult to determine what Slackware has to offer beyond what is available from more sophisticated distributions.

### SuSE Linux 5.2

SuSE Linux is a popular distribution featuring a good range of packages and strong support for German speakers.

The official boxed set comes with four CDs, a boot floppy, and a highly technical 430-page reference guide. SuSE is also available free for download via FTP.

Installing SuSE first involves booting from the set-up floppy or CD, then selecting a preferred language, keyboard type and display type. The next step is to load

any kernel modules required for the remainder of the installation, such as SCSI and network card drivers. An option exists at this stage to perform a full probe of the system, which may cause it to hang. It is probably better to try to determine the hardware used on the system before this stage, and load only the modules required.

Next, the source media may be selected, with options including CD, local hard disk and NFS. Following this, the remainder of the installation is managed by YaST (Yet another Setup Tool). After an initial reboot, YaST

fires up and completes the configuration of the system. The set-up procedure is workable, although quite clumsy in places, and definitely not as simple as it could be.

Once up and running, however, SuSE is very usable, with extensive online documentation and a good range of software packages. YaST is a versatile tool, and may be used for a variety of system maintenance tasks, including user account management, package administration and general configuration.

X Window is set up very nicely under SuSE, and its management is made easier through the use of a specially developed tool called 'susewm'. This provides a centralised means to configure eight popular window managers, including fwm, AfterStep and kwm. SuSE has also recently released a number of custom X servers, which work with a wider variety of video cards than the standard XFree86 servers. These are available for download from <http://www.suse.com/>.

Purchasers of the boxed set receive 60 days' free email support, and a series of SuSE-specific mailing lists are provided for all users.

SuSE is a good distribution for exploring Linux and is probably best suited to technically oriented users.



## Want more Linux?

Interested in checking out Linux? Don't want to spend money or time buying an expensive book or downloading from the Web? Wouldn't you prefer to buy just one book that has everything you need and nothing you don't? Welcome to APC's *Linux Pocketbook*.

On sale in early October, the *Linux Pocketbook* is your best introduction to the power, stability and features of Linux. Within its pages you'll learn how to install Linux, optimise your system, set up X

Window, configure Web and FTP servers, administer accounts, master the shell, connect to Windows networks and much more. The *Pocketbook* comes with a cover CD that contains the full release of Red Hat Linux 5.1 as well as a large collection of the best updates, utilities and applications to make the most of your new installation.

If you're keen to get a head start with Linux, the *Linux Pocketbook* is the right guide for you.



## Making a choice

The diversity and quality of Linux distributions is impressive, illustrating the effectiveness of free software models and open collaboration; as well as the potential for successful commercial involvement.

Three of the major distributions reviewed stood out significantly as OSes that could readily compete with mainstream commercial products in terms of both core functionality and general manageability (see Editor's Choice, page 94). Many distributions are also making strong progress in the area of making Linux easier for normal, less technically proficient people to use.

With growing recognition from larger software vendors — most notably Oracle in recent times — and the ongoing advances in distributions, Linux is growing as a promising alternative in the way software is developed and used.

## Obtaining Linux

Generally, it should not be difficult to obtain a Linux distribution these days; a large number of book shops and computer retailers stock CD sets and Linux books with CDs inside the back covers. Many people simply borrow copies from friends, or obtain specially pressed CDs from educational institutions. Of course, it is also possible to buy online from vendors and resellers.

If unsure, the best place to start is with the Linux community. User groups, mailing lists and newsgroups are all valuable sources of support. A great jump-off point for Australian users is the Linux Australia Web site (<http://www.linux.org.au/>), which provides a good deal of information on local resources.

Alternatively, you could check out APC's *Linux Pocketbook* on sale in early October. See 'Want more Linux?' on page 102 for more information.

## Acknowledgements

Thanks must go to members of the Linux community who assisted in the preparation of this feature. Specifically, Terry Dawson from Linux Australia who helped to clarify some points in the history of Linux; and Debian developer Tyson Dowd, who supplied a Debian Beta CD.

Thanks also to Linux Press for supplying a preview copy of its *Debian Linux User's Guide*. ■

## Glossary of terms

<b>AfterStep</b>	A popular window manager based on the classic NextStep interface.
<b>bootp</b>	Bootstrap Protocol. Typically used to allow diskless workstations to be automatically configured and possibly loaded with an operating system over a network on startup.
<b>DHCP</b>	Dynamic Host Configuration Protocol. Based on bootp, DHCP dynamically allocates network addresses to machines when they boot up. This is commonly used in Microsoft networking.
<b>egcs</b>	An evolution of the GNU compiler, GCC. Compilers are used by developers to build software.
<b>fdisk</b>	Disk partition management tool. Even scarier than the DOS version. Keep out of reach of children and intelligent pets.
<b>file system</b>	Formatted disk partition. You need at least one of these.
<b>fvwm</b>	Another popular window manager. fvwm95, default on many systems, attempts to emulate the Windows 95 look and feel. Can be useful for hiding the fact that you are running a real OS from your boss.
<b>Gnome</b>	GNU Network Object Model Environment. Ambitious, buzzword-compliant project aimed at providing a free, integrated desktop environment. See <a href="http://www.gnome.org/">http://www.gnome.org/</a> .
<b>GNU</b>	GNU's Not Unix. Long-term project that aims to develop a free, comprehensive Unix-like operating system. Much of Linux is built with GNU components. See <a href="http://www.gnu.org/">http://www.gnu.org/</a> .
<b>KDE</b>	The K Desktop Environment. Impressive project providing a freely available integrated and sophisticated user interface for Unix systems. See <a href="http://www.kde.org/">http://www.kde.org/</a> .
<b>kernel module</b>	A component of the kernel that can be loaded as needed, such as a device driver or networking component.
<b>LILO</b>	Linux Loader, system boot loader that allows for multiple operating systems to be booted from the same machine.
<b>loadlin</b>	Loads Linux from a DOS shell.
<b>Motif</b>	Commercial, high-level GUI toolkit, providing a consistent range of user interface components such as dialog boxes and menus. Netscape for Linux uses this.
<b>NFS</b>	Network File System. Allows file systems to be shared over a network.
<b>Tcl/Tk</b>	Tcl (Tool Command Language) is a scripting language, while Tk (Tool Kit) is a graphical extension to Tcl that allows for fast, easy development of GUI applications.
<b>UMSDOS</b>	A system for running Linux on an existing DOS partition. It is slower than running under a native file system, but quite useful for trying out Linux without making major changes to the disk partitions.
<b>Unix</b>	Multitasking, multiuser OS initially developed in the 1970s, which has significantly evolved and is now available in many forms. Technically, Linux is a clone of Unix.
<b>window manager</b>	Manages screen resources, providing a means for moving, resizing, iconifying and destroying GUI applications. Largely responsible for the look and feel of the desktop, a variety of different window managers are available.
<b>X</b>	More formally known as the X Window System, this is a flexible, networked GUI for Unix type systems.
<b>XFree86</b>	A project that has made X freely available for Intel PC systems.





Hubble Telescope

# NASA DOESN'T COMPROMISE WHEN IT COMES TO IMAGING HARDWARE, OR SOFTWARE.

**TO LAUNCH THE ONLY ENTERPRISE-WIDE GRAPHICS SOLUTION,  
GO TO [WWW.MICROGRAFX.COM/NASA](http://WWW.MICROGRAFX.COM/NASA)**



"With the help of  
Micrografx Picture Publisher,  
we deploy thousands of images  
on-line for the world to explore."  
Rick Slater, NASA Technical Monitor,  
Photographic & Digital Imaging Group

Suite 2 also includes FlowCharter 7 for process  
and business diagramming, Designer 7 for

NASA's Digital Imaging Lab  
at Johnson Space Center publishes  
thousands of out-of-this world  
pictures on the Internet. And to  
make sure those images are clear,  
bright and download fast, they use  
Micrografx Picture Publisher.

Picture Publisher is one of four  
user-friendly, best-of-breed graphics  
tools in Graphics Suite 2. It's the only  
enterprise-wide graphics solution with  
complete graphics and  
professional power—  
all with Microsoft Office  
simplicity. Graphics

technical graphics publishing, and  
Simply3D 2 for easy 3D  
presentations and web graphics. It's  
the perfect solution, across the  
enterprise, for every need.

Plus, Graphics Suite has the  
lowest total cost of software  
ownership among enterprise graphics  
packages and increases productivity  
through comprehensive network deployment, education  
systems and usability features.

It's no wonder Fortune 500 companies everywhere  
are standardising on the only enterprise-wide  
graphics solution – Graphics Suite 2.

**For your FREE Enterprise Graphics  
Solution trial CD-ROM, call 1800 644 298  
or visit [www.micrografx.com/nasa](http://www.micrografx.com/nasa).**



Integrating four best-of-breed  
applications, Graphics Suite 2  
is the only enterprise-wide  
graphics solution.



Licensing for Graphics Suite 2 is available. For more information call Micrografx on (02) 9415 2642. ©1998 Micrografx Inc.



005A

## Picture The Possibilities



*There are vast price differences between image editors, but do you get what you pay for?* **By Jim Endersby**

## Picture perfect

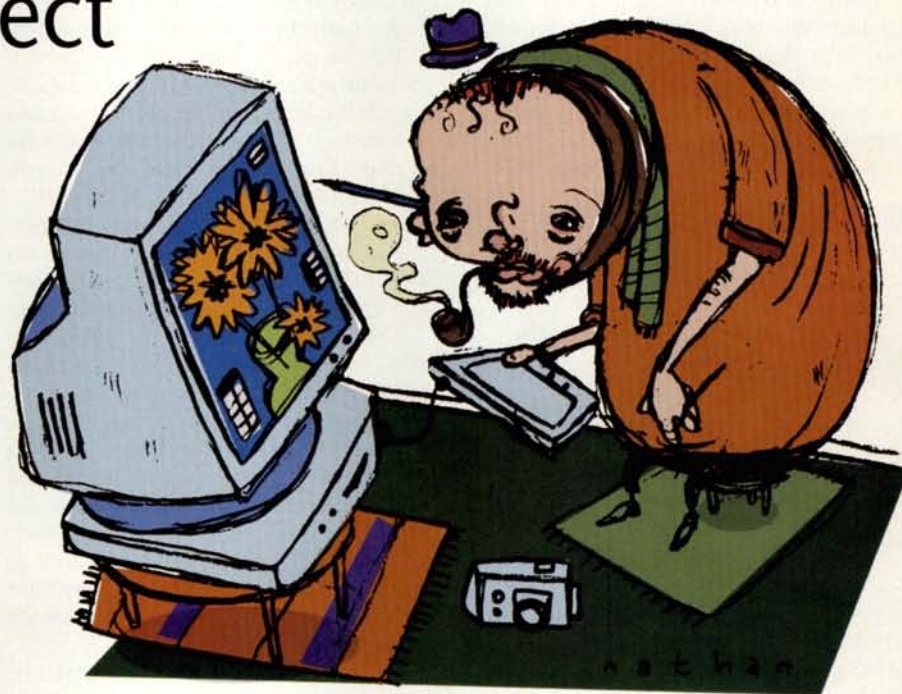
**I**mage editors — also known as paint programs — are designed to edit bitmap graphics (as opposed to vector graphics, which are created with drawing programs). The most common sources of bitmaps are scanned images, such as photos, but digital cameras are also becoming a major source of bitmap images.

An image editor is generally used for manipulating bitmap images. This can range from colour correction or enhancement, to removal of blemishes (using the electronic equivalent of an airbrush), to application of various special effects or combining several photos or other images into a composite image.

Photomontage (combining photos creatively) has always been popular with graphic artists and designers, but the advent of digital photography and image editing has led to an epidemic of montage. The sheer ease with which it can be done has made it an increasingly attractive approach to creating imagery for advertisements, book jackets, CD covers and thousands of other uses. However, as with all computer-influenced design, when it's done by inexperienced or unimaginative artists, the technology often ends up dominating the creative impulse, with predictably banal results.

The other major area dominated by image editors is the World Wide Web. Currently, the vast majority of Web graphics are bitmapped, so image editors have become an essential tool for Web designers. However, if you're a software manufacturer trying to ensure that your new image-editing program stands out from the pack, try splashing 'Contains NO Internet features!' all over the box, because you can be sure that bragging about your Web design tools is not enough to grab anyone's attention these days.

Indeed, when it comes to Web design, the big issue now is not how to produce your Web site, but how to create some-



thing that's even remotely original. A couple of years ago, a book on advanced Web design would contain 10 pages of instruction on how to create 3D type — with bevelled edges and soft, transparent drop shadows — in 32 laborious steps. All but one of the programs we tested have built-in features for creating these effects in a single action. They have now become clichés, as common as the round-cornered boxes and drop caps which settled like a plague of locusts over desktop publishing 10 years ago.

Professional graphic designers make heavy demands on their image-editing software and we've tried to reflect this in our testing procedure (See 'How we tested', page 110). Any of the programs reviewed here will make light work of a 512K scan, but most of them start to choke when you begin feeding them 20M files. Similarly, when it comes to selecting and modifying sections of images, replacing a distinct and uniform background is no challenge, but our image selection test was deliberately designed to push these

programs to their limits. Not everyone will need these abilities, but if you're a full-time professional then the difference between waiting 10 seconds and waiting 30 for your file to process can be the difference between meeting deadlines and missing them. However, it's worth noting that if your image-editing needs and budget are both pretty modest, a professional tool like Adobe's Photoshop 5 (our Editor's Choice winner) might be overkill — Jasc's superb Paint Shop Pro could prove a better option.

We tested all these programs using the final release version of Windows 98, running on a Pentium Pro 200 with 128M of RAM and an 8M Matrox Millennium II graphics card. This system hardly qualifies as state-of-the-art these days, but it represents a fairly average setup for a graphic designer. Those of you lucky enough to be running Windows NT 4 on dual Pentium II 400MHz processors with 256M of RAM and a 16M AGP graphics card can be confident that any of these programs will fly along on your system.

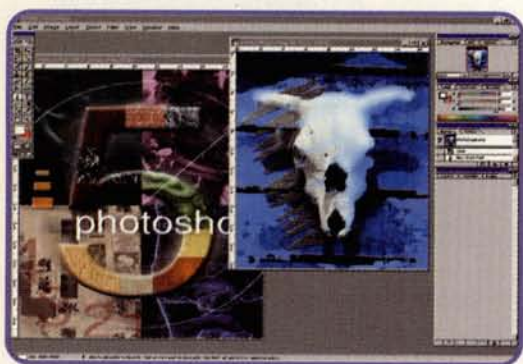


## Photoshop 5

ADOBE

Given its market lead, Adobe's Photoshop is the standard against which all other image editors are measured. Knowledge of Photoshop is a common requirement for many graphic or Web design jobs (and it's the only program reviewed here for which that is the case).

This version presented no problems with our standard tests (see 'How we tested', page 110). Retouching and colour correcting photos to a high professional standard has been Photoshop's main purpose ever since it was launched, and it made quick work of our photo-retouching test. Photo-



shop's colour correcting tools allow an almost endless variety of options. In fact, the only possible criticism would be that its options are so extensive as to be intimidating for a first-time user. But this is very much a professional tool and its power more than repays the time taken to learn it.

Photoshop also excelled in our second test, image combining. The potentially nightmarish task of separating figures in dark clothes from a dark, patterned background was made considerably easier by the new 'magnetic lasso' tool. This is similar to the old lasso (which allowed you to

draw a freehand selection area), but the new version 'snaps' to the best-defined edge near the line you've drawn. This is perfect for those all-too-common situations when, for example, the area you're trying to select is light-on-dark in some parts and dark-on-light in others. We used Photoshop's adjustment layers to temporarily increase the brightness and contrast of the image while we were defining our selection area, and then discarded the changes after the selection had been made.

There's also a magnetic pen, which works in a similar way to the magnetic lasso, but allows you to draw vector paths on your image. This is ideal for such tasks as exporting EPS files with irregularly shaped transparent backgrounds.

Adding type to images in Photoshop has been greatly improved; it's now possible to preview and move your type in the image-editing window before you close the type dialog box. The new layer effects include the widely used emboss and drop-shadow effects that we needed, so adding these to the type took only a few seconds. An exceptional feature of both the enhanced type tool and the new layer effects is that they remain editable at all times, so that

if you need to change the type later you can do so without having to re-create the effects.

Among the many other new features in this version is the long-overdue multiple undo. Previous versions of the program allowed only a single undo, which was a source of frustration for many users. Adobe has implemented multiple undo via a history list, which records all the steps taken in creating the image. This lets you go back to any step, see how the image looked at that point, and then discard any or all of the subsequent steps. Even more innovative is the new History Brush, which allows

you to selectively paint earlier states of an image over the most recent ones.

We tested all these programs using the shipping version of Windows 98, which allowed us to test their integration with the new ICM (Image Color Management) system, due to its built-in support for ICM 2.0. Windows NT 5.0, when it arrives, will also support ICM 2.0. Photoshop ships with a large selection of International Color Consortium (ICC) colour profiles, which are fully compatible with ICM 2.0. These can now be installed via the Windows Control Panel. This is a new approach to colour management on the PC — the Mac has had it for a while. It allows you to create common colour calibration settings for all the compatible applications you use. This is a great timesaver and will also improve cross-platform compatibility, because ICC profiles are also part of the ColorSync system built into Mac OS.

■ <b>Distributor</b>	Tech Pacific
■ <b>Phone</b>	(02) 9381 6000
■ <b>Online</b>	<a href="http://www.pacific.adobe.com/">http://www.pacific.adobe.com/</a>
■ <b>Price</b>	\$1,495
■ <b>In short</b>	The market leader does it again; Photoshop 5 is nothing short of superb.

## PhotoPaint 8

COREL

After a brief flirtation with the idea of shipping upgrades that were faster than their predecessors (such as CorelDRAW 7, which was noticeably faster than Version 6), Corel seems to have reverted to its former habit of shipping bloated, slow applications. Version 8 of CorelDRAW was distinctly sluggish compared with Version 7, and unfortunately the same is true of PhotoPaint 8.

For example, the unsharp mask filter in our first test took three times as long to apply as the same operation in Photoshop.

THE RIGHT COMBINATION...

# ... of Safety and Protection

If you're after superior protection to lock viruses out of your valuable documents and applications, **Vet** is the iron clad program you can trust. With easy to use features **Vet** protects against thousands of conventional and macro viruses and is suited to any PC platform as well as Novell NetWare and NT Server. Confidence in **Vet**'s abilities extends from governments and banks to companies and individuals in over 30 countries world wide.

**Unlike other software developers, we only make anti-virus software so it's natural that we're the experts at it.**

So, if you're running a business or surfing the Net, Australian made **Vet** has all the protection you'll need, including products with free mailed upgrades to make sure you stay protected. So contact us now for a free evaluation copy and feel the security only **Vet** can offer.



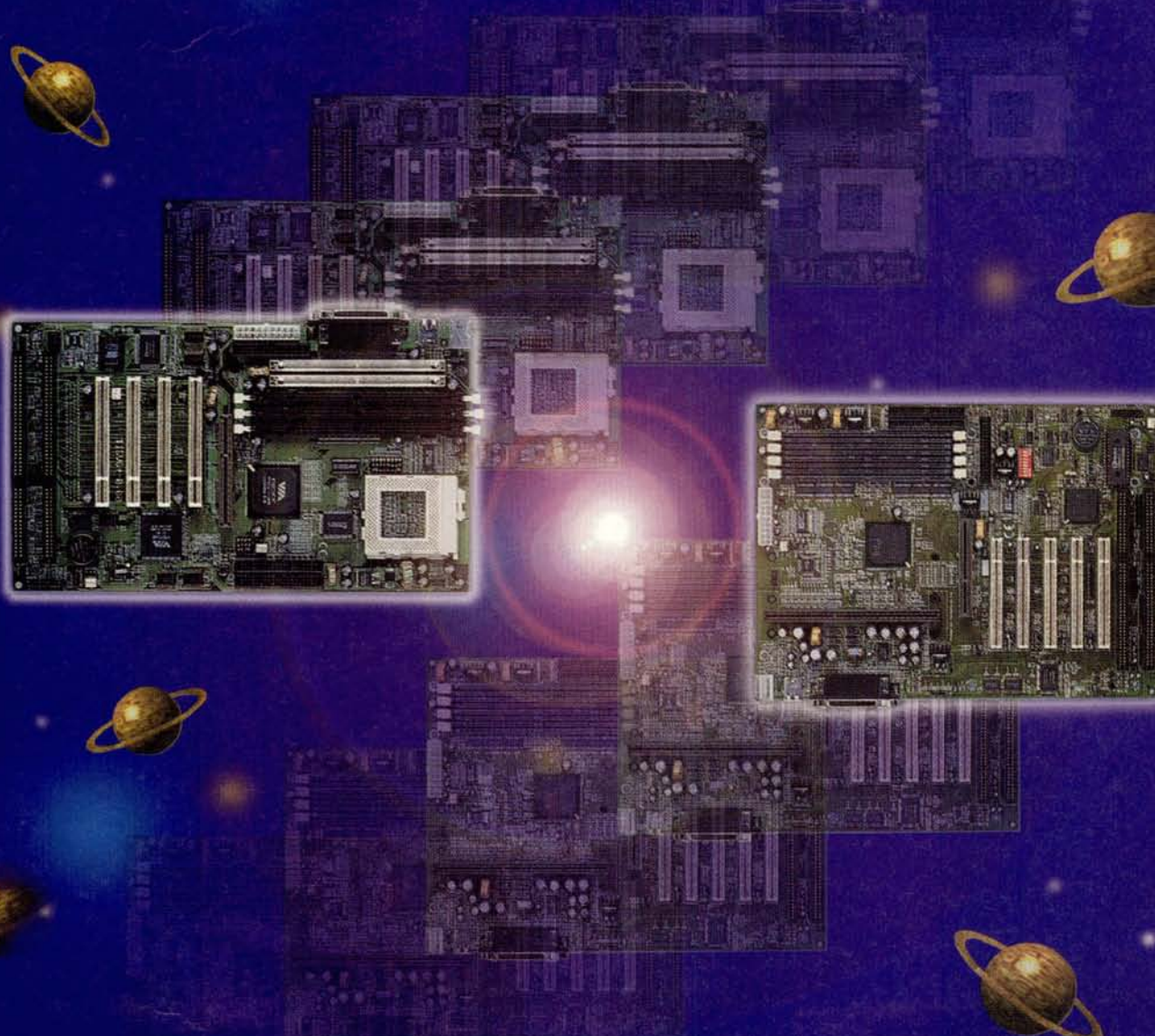
Evaluate Vet for Windows 95, 98, NT Workstation and 3.x at [www.vet.com.au](http://www.vet.com.au)  
For your nearest reseller or an information pack telephone 1300 364 750 Email: [info@vet.com.au](mailto:info@vet.com.au)

All the Anti-Virus you need

# vet



AnandTech gives TMC the highest ratings  
check out the facts at  
"www.anandtech.com"



**TI6NB Intel 440BX Supreme Motherboard**

- Intel 440BX, AGP, ATX
- Pentium II® (Klamath/Deschutes) 233~450MHz
- 66MHz/100MHz CPU bus speed
- DIMM x 4, 512MB Unbuffer SDRAM, 1GB Buffer SDRAM
- Hardware monitoring: system temperature, voltage and fan speed
- AGP slot, USB, IrDA, ACPI, Wake on LAN
- Creative AWE640D SB-Link connector
- Modem ring-on, Win95 shut-off

**TI5VG+ The King of the Socket Super 7**

- VIA VP3/MVP3, ATX
- P55C/MMX™, Cyrix 6x86(L/MX), AMD K5/K6/K6-2
- 66/75/83/95/100MHz CPU bus speed
- SIMMx2, DIMMx3, up to 768MB EDO/SDRAM
- Hardware monitoring: system temperature, voltage and fan speed
- AGP slot, USB, IrDA, ACPI, Ultra DMA/33
- Win95 shut-off, Modem ring-on, Wake on LAN



Taiwan Mycomp Co., Ltd.

1F, No. 16, Lane 50, Nan Kang Rd., Section 3, Nan Kang District, Taipei, Taiwan, R.O.C.

The: 886-2-2782-0201 Fax: 886-2-2782-7486 BBS: 886-2-2782-1988

http://www.mycomp-tmc.com E-mail: tmc@mycomp.com.tw





Other operations, such as adjusting brightness and contrast, were also sluggish; even file opening and saving were 50% slower than in Photoshop, creating the impression overall of an unresponsive program. The times involved may not seem significant, but they can mean the difference between a program that's a pleasure to use and one that's rather painful.

Apart from the relatively slow operation, however, PhotoPaint performed well in our first test, due to its very comprehensive set of image retouching and colour adjustment tools. We were able to make all the adjustments we wanted without difficulty.

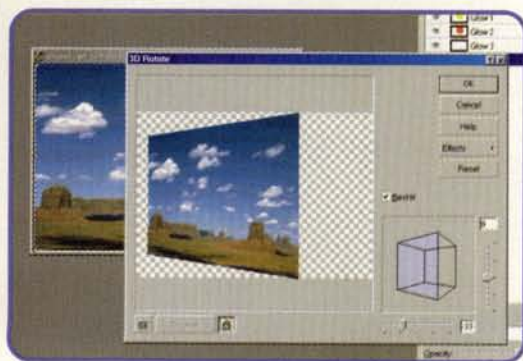
However, this test did suggest a possible reason for PhotoPaint's slowness — perhaps it's a side effect of Corel's insistence on making every conceivable aspect of the program customisable by the user. Some of these options are undoubtedly useful, such as being able to choose from one of several different screen layouts to mimic the appearance of another program with which a new

manual updates would make sense if you were previewing an effect across a whole image — the endless screen redraws can certainly become tedious — the whole point of a thumbnail preview is that it should be instantaneous. Why would the programmers provide the option of switching off the instant preview unless they were worried that even their thumbnail preview was too slow?

When it came to our second test we found the overall speed of PhotoPaint consistently disappointing, but it had all the tools needed to do the job. The only exception was the admittedly difficult test of separating the darkly clothed figures from their messy background, which proved nightmarish (as it did in almost every other program). But at least adding the type was a breeze, and PhotoPaint includes very simple features for creating the common special effects that we wanted.

One area where PhotoPaint has a significant edge over its rivals is in scripting and automation. Corel Script is a powerful scripting language that can be used to do everything from recording simple macros to writing standalone programs. It is common to several of Corel's major graphics applications, including CorelDRAW and Ventura, so that it's possible to create custom applications that integrate the functions of these programs. However, while there's no disputing its power, Corel Script would undoubtedly prove too complex for anyone without some programming skills. Despite the fact that it's largely modelled on the widely used Basic language, Corel Script is still too specialised for most designers to get to grips with.

PhotoPaint supports a range of common Internet-oriented tools, such as the ability to export files in GIF, JPEG or PNG formats, with fairly wide-ranging con-



user might be more familiar. However, others seem unnecessary. For example, the thumbnail preview, which appears in the dialog boxes for the various effects can be set either to preview automatically or to be updated manually. While



#### EDITOR'S CHOICE

- **Adobe Photoshop 5**
- **Jasc Paint Shop Pro 5**

For professional designers with sophisticated image-editing needs (and a software budget to match), Adobe's award-winning Photoshop is still the best tool for the job. It continues to set standards for both performance and innovative features.

However, if you don't need such a powerful (and expensive) tool, then Paint Shop Pro is the best choice. It has about 80% of Photoshop's power for around 10% of the price. The only major point against it is its lack of really good Internet-specific tools.

trols over such issues as converting images to 8-bit colour (for GIF export) and setting transparency, interlacing and other features. You can also create fairly complex imagemaps — both client and server-side. The online help provides fairly comprehensive guidance to all these options and explains key terminology clearly.

However, more advanced features such as PhotoPaint's animation support are not quite as impressive. Compared with specialist Web graphics tools such as Adobe's ImageReady or Macromedia's Fireworks, PhotoPaint's animation support is a little ordinary, with no support for timesaving features such as tweening (generating intermediate steps automatically).

EVERYONE KNOWS...

## ...Aussies make the best Surfers

If you're concerned about viruses while surfing the Net you can rely on **Vet**—the all-Australian software that offers you superior protection and full local support. **Vet** protects against thousands of conventional and macro viruses and is suited to any PC platform as well as Novell NetWare & NT Server.

**Unlike other software developers, we only make anti-virus software so it's natural that we're the experts at it.**

Confidence in **Vet's** abilities extends from fellow surfers to governments, banks and companies in over 30 countries world wide. So if you're on email or surfing the Net, **Vet** has all the protection you'll need, including products with free mailed upgrades to make sure you stay protected. And after all when you go surfing who wants to worry about the quality of the water.



Evaluate Vet for Windows 95, 98, NT Workstation and 3.x at [www.vet.com.au](http://www.vet.com.au)  
For your nearest reseller or an information pack telephone 1300 364 750 Email: [info@vet.com.au](mailto:info@vet.com.au)

**All the Anti-Virus you need**

**vet**



# How long are you waiting for your first page?

The OKIPAGE 20N – OKI's new 20-page-per-minute networkable printer – delivers your first page in only seven seconds. Which is remarkable when you realise that it costs less than many 16-page-per-minute machines. And with its 1200 dpi class, optional duplex

capability and OKILAN 510E network interface card, we think you'll agree that the OKIPAGE 20N offers unbeatable value.

For further information, please call **1800 800 140** for your nearest supplier or visit our website at [www.oki.com.au](http://www.oki.com.au)

# OKI

People to People Technology





## How we tested

Because each program has different features, it's not easy to compare them directly. However, we assessed each program's basic tools by repeating two common image-editing tasks.

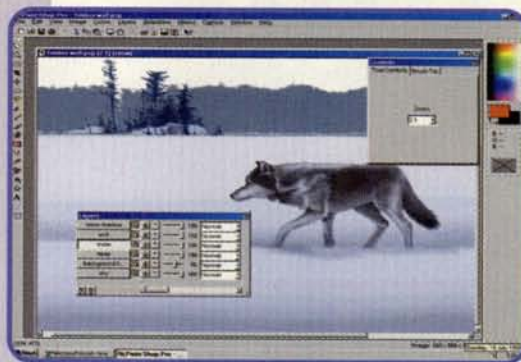
In the first test, we simply scanned in a photo at full size, at fairly high resolution and 24-bit colour depth (this produced a file of about 23.5M). We timed how long each application took to open and save this file. Then we conducted a series of common image-correction adjustments: an unsharp mask filter (a standard tool for improving scans from flatbed scanners); cropping and scaling the image; adjusting brightness and contrast; and then adjusting colour balance and saturation. A fairly poor-quality image was selected for the test, as we wished to see how well each program coped with removal of a moiré pattern (the interference pattern created by digitising an image that's already composed of dots). We assessed overall speed, how easy each of these very common operations was to carry out, and noted any

particular features that made the program either easy or difficult to use.

The second test involved combining two images. The first had a clearly defined separation between the image and the sky; we tried isolating the sky, deleting it and inserting a new sky. The second image also needed its background removed, but in this case the two dark figures were very poorly differentiated from a dark, patterned background. This is a very difficult task to perform using most image editors, and it can be very time-consuming. Finally, we combined the two images, added some type and then added a combination of embossed and drop-shadow effects (which are commonly used in Web design).

Lastly, we assessed the program in terms of its range of features (especially innovative or unusual ones), the quality of its interface design and documentation, and how easy it was to use.

responsive and accurate as the equivalent in Photoshop, so selecting and replacing the sky was easy. However, it would have been useful to have the 'remove holes' (from a selection) option that's found in Picture Publisher, because Paint Shop tends to leave small areas unselected, but doesn't always highlight them onscreen. As a result, you may unexpectedly find small portions of the underlying image showing through after you've inserted a



new image into a selection. When creating composite images, we also found Paint Shop's ability to promote any selected portion of an image into a layer very handy.

Paint Shop did better in our image selection test than most of its rivals, mainly because its magic wand tool works so quickly and makes accurate, easily adjusted selections. Although we still had to do a lot of cleaning up and adjusting by hand in order to get precisely the selection we were after, we rated Paint Shop second in this very tricky test. This is, once again, a most impressive result when you consider that it's the cheapest program tested.

However, we were slightly disappointed with Paint Shop's text-handling abilities. Like several of the other programs tested, there's no way to preview the text within the image, nor can you create vertical type

- **Distributor** Corel
- **Phone** 1800 658 850
- **Online** <http://www.corel.com/>
- **Price** \$636; upgrade \$209
- **In short** Unless you received PhotoPaint free when you bought CorelDRAW or Ventura, there's no compelling reason to use this sluggish program.

## Paint Shop Pro 5

JASC

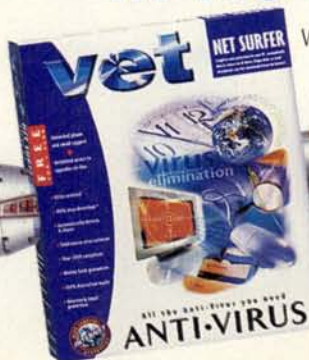
Paint Shop Pro opened our test file as fast as any other program tested, and it took

only fractionally longer than Photoshop to apply its unsharp mask — a result which is all the more impressive when you consider that Photoshop costs nearly 10 times as much as Paint Shop Pro. This new version's range of colour adjustment options is also almost as comprehensive as those found in more expensive software. Adjusting colour balance, contrast and brightness were all straightforward, but perhaps not quite as simple for beginners as the visual approach used in some programs.

This program also performed well in our second test; its magic wand tool is as

FOR VIRUSES...

# ... it's a Weapon of Mass Destruction



When it comes to viruses Vet has an uncompromising history of eradication. If all our customers killed only one virus a year for the 9 years we've been in business, that would total over 5,000,000 viruses destroyed by Vet world wide.

Unlike other software developers, we only make anti-virus software so it's natural that we're the experts at it.

Confidence in Vet's abilities extends from governments and banks to companies and individuals in over 30 countries world wide. Australian made Vet protects against thousands of conventional and macro viruses and is suited to any PC platform as well as Novell NetWare & NT Server. So if you're running a business or surfing the Net, call us now for a free evaluation copy and see how Vet goes ballistic on viruses.

Evaluate Vet for Windows 95, 98, NT Workstation and 3.x at [www.vet.com.au](http://www.vet.com.au)  
For your nearest reseller or an information pack telephone 1300 364 750 Email: [info@vet.com.au](mailto:info@vet.com.au)

All the Anti-Virus you need





**THERE'S ALWAYS A SMALL  
PRICE TO PAY  
FOR RELIABILITY.**

**HERE IT IS**



Before investing in a new HP NetServer, remember: The utility power isn't always reliable. A single power problem could cost you a fortune in data loss, hardware damage and downtime. For a fraction of the cost of an HP NetServer, you could prevent these hazards with the world's most reliable power protection, APC.

Award-winning APC Smart-UPS's instantaneous battery back-up saves your data during blackouts, while full-time surge

suppression protects your valuable HP NetServer from hardware damage. In addition, APC PowerChute® *plus* seamlessly integrates with HP OpenView and HP NetServer Assistant to provide unattended, automatic system shutdown, advanced UPS management capabilities and valuable power diagnostics.

To find out how little it costs to have a more reliable networking system, contact HP or APC today.



The world's most reliable  
power protection

Tel: 1800 652 725  
Fax: (02) 9955 2844  
<http://www.apcc.com/australia>



Expanding Possibilities

Tel: 13 13 47  
Fax: (03) 9898 1968  
<http://www.hp.com/go/NetServer>

**Get a FREE Back-UPS when you purchase  
any HP NetServer with an APC Smart-UPS!**

Just fax/mail this coupon to APC for more information  
on how you can get a FREE Back-UPS, or visit  
<http://www.apcc.com/australia/promo/hp>. For enquires  
on HP NetServers contact HP on Tel: 131347

Name \_\_\_\_\_ Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_  
Postal \_\_\_\_\_ Code \_\_\_\_\_  
Phone \_\_\_\_\_ Fax \_\_\_\_\_



HPA-0801



or mix fonts within a selection. You also cannot re-edit text once it has been created — you have to delete it and start again. We also found the text effects somewhat limited. There's no way to create the bevelled effect that we required for the second test — Paint Shop's Buttonize filter only works with rectangular selections. There is a perfectly adequate drop shadow effect, but you'll need to buy a third-party plug-in (Paint Shop offers full support for PhotoShop-compatible plug-ins) in order to create many common text effects.

Somewhat surprisingly, given the current obsession with the Internet, Paint Shop has few features that are specifically intended for creating Web graphics. You can export images as GIF, JPEG or PNG, but there are no options in the dialog boxes for optimising, interlacing or adding transparency to your images when exporting. Nor can you preview different export options in order to compare options. There is no information in the manual or online help on these issues, nor are there any features for creating even basic imagemaps. The only real concession to the Web is the inclusion of Animation Shop, a standalone tool for creating animated GIF files. It has a useful Animation Wizard, which will help get beginners up and running quickly, and it also has some good transition effects and optimisation tools. However, it lacks timesaving features such as tweening.

Among the new features in this version of Paint Shop is the Picture Tube tool. This is a well-implemented copy of the famous Image Hose, pioneered by Fractal Design in its Painter program (see sidebar, page 115). The Picture Tube allows you to 'spray' a series of smaller images onto your picture, allowing you to build up complex random effects, like a pile of leaves or a background of pebbles, quickly and easily. You can create your own Picture Tubes by saving illustrations or scanning in images, and new ones can also be downloaded from Jasc's Web site (<http://www.jasc.com/>).

■ <b>Distributor</b>	Communique Software
■ <b>Phone</b>	(02) 9622 5624
■ <b>Online</b>	<a href="http://www.communique.com.au/">http://www.communique.com.au/</a>
■ <b>Price</b>	\$169
■ <b>In short</b>	Excellent value for money, with enough options to meet most image-editing requirements, but its surprising lack of Internet-specific tools undermines its suitability for Web design.

## xRes 3

### MACROMEDIA

When it was launched almost two years ago, xRes had a substantial speed advantage over many of its rivals, particularly when it came to editing large files. It managed this by using a proprietary xRes work mode, which worked on tiles of data, rather than individual pixels, and required some post-processing (your changes were applied to the original image after you'd finished deciding what



they were going to be, rather than as you went along). There was always a drawback to this way of working, most noticeably the fact that some tools — such as the magic wand and the paint bucket — didn't work in xRes mode, because they were designed to act on individual pixels.

However, in the past couple of years image-editing software has moved on while xRes has stood still. As a result, it now seems conspicuously slower than its main rivals. Opening the file for our first test, for example, took almost three times as long in xRes as it did in Photoshop, and applying the unsharp mask filter took more than 10 times as long in xRes. These comparisons were made using xRes' Direct Mode, because it is equivalent to Photoshop's only mode. You can speed things up considerably by using xRes mode, but only at the cost of losing many essential tools (we also found that most Photoshop plug-ins don't work in xRes mode, despite the fact that Macromedia claims they will).

Once we had managed to open our test file and had finished waiting for the unsharp mask filter to complete, we found the program's colour correction tools were very comprehensive — as good as Photoshop's. They could be applied reasonably easily, although the overall slowness led us to give xRes below-average marks in our first test.

When it came to the second test, we were even more disappointed. Once again, we had to work in Direct Mode because we needed to use the magic wand

tool to isolate the sky in the first image. Selecting adjacent pixels of the same colour proved to be an agonising task; xRes took more than 30 seconds to display the area selected each time we clicked with the magic wand. This made experimenting with the sensitivity settings, and then building up the area selected with multiple clicks, almost unbearably slow.

It's also worth noting that we chose a preprinted postcard of fairly poor quality as the image scanned for the first test, because we wanted to see how well the programs coped with removing a moiré pattern (the interference pattern created when an image that's already composed of dots is digitised). Unfortunately, xRes doesn't have any tool suitable for this common task. There were also no tools specifically designed to help with the awkward selection problem presented by our third test file (see 'How we tested', page 110).

When it comes to adding type to an image, xRes doesn't offer any preview of the font or size (either in place or in the dialog box), nor is it possible to edit a text object after you've created it — you have to delete it and start again. Finally, while it's possible to create a drop shadow fairly simply, there is no simple way to create the emboss effect we wanted. As a result of all these problems, we were unable to complete the second test using xRes.

Despite the weaknesses highlighted above, xRes does have its strengths, most noticeably when it comes to creating original artwork (as opposed to modifying scanned images). Among these are its brushes, which include some very natural looking transparent effects, such as water-colour. These brushes all have extensive pressure-sensitivity options, so if you have a pressure-sensitive drawing tablet you can decide whether varying the pressure will alter the size, intensity, colour or other features of the stroke you're creating. However, even these impressive tools don't compare to those available in MetaCreations' Painter 5 (see sidebar, page 115).

■ <b>Distributor</b>	Firmware Design
■ <b>Phone</b>	(02) 4721 7211
■ <b>Price</b>	\$839
■ <b>Online</b>	<a href="http://www.macromedia.com/">http://www.macromedia.com/</a>
■ <b>In short</b>	xRes has fallen behind its rivals in many key areas and is now badly in need of an update — especially when you consider its price.



# Zip In...Zip Out



## Computerised tracking of staff time and attendance

**Y**ou've probably been accumulating and then calculating the times for your payroll in the same time-consuming and error-prone way for years.

But there is a better way, one that will take less time and involve less stress.

This way staff clock in and out by just sliding a barcoded card along a slot. Their clocking times are stored and directly processed by your computer, saving all the manual work of other methods.

The product is ASP's ZipNet, and it comes as a complete package of hardware and software. The ZipNet Terminal displays the time and collects the barcode scans, then ASP's ZipNet Timesheet software (for Windows) collects data from the Terminals, applying the shift and time adjustment rules you've set for your workplace.

The resulting summaries can optionally be linked to your payroll program.

The ASP ZipNet Package includes everything you'll need: a ZipNet Terminal, Network Adaptor, Timesheet software, even cable and plastic staff cards, for under \$1,500!



You can add extra ZipNet Terminals whenever you like, and compatible ASP products are available to extend your data collection into production tracking and time costing in the future.

The ZipNet package is Australian designed, manufactured and supported by the Company that has been innovating for over twenty years, ASP Microcomputers.

Call now for demo package, and discover how a simple "zip in...zip out" can "save time...save money".

### ASP Microcomputers

456 North Road, Ormond VIC 3204

Telephone (03) 9578 7600

Fax (03) 9578 7727.

email: [solutions@asp.com.au](mailto:solutions@asp.com.au)

[www.asp.com.au](http://www.asp.com.au)

Dealer enquiries welcome.

*asp data collection-*  
**automatic, simple, perfect.**





## Picture Publisher 8

MICROGRAFX

Picture Publisher is priced like an entry-level program, but it has many of the features of a professional one. Taking a similar approach to Ulead's PhotoImpact (see next review) it succeeds in being both powerful and easy to use. Like PhotoImpact, Picture Publisher is compatible with Microsoft's Office suite. It uses many of the same keystrokes, which will make it easier to learn for many people.

However, this is not a low-end product. Among the many new features in this version is support for the Kodak Color Management system, which allows to you to calibrate your monitor with input and output devices (digital cameras, scanners and printers), to ensure professional-quality colour matching. This is the type of professional feature usually only found in more expensive tools.

Picture Publisher did fairly well in our first test: it opened the file as quickly as Photoshop. But like most of the other programs reviewed here, Picture Publisher tends to balk at processing large files. Applying the unsharp mask filter, for example, took almost six times as long as it did in Photoshop. There are several wizards to help with common tasks, including a Photo Fix wizard, which takes the user through common image-enhancing tasks, but we found it disappointing to use. It's just too slow to be helpful, with tedious delays between the steps and a lengthy delay in restoring the main image when the dialog box is closed — even if you've cancelled the wizard without making any changes.

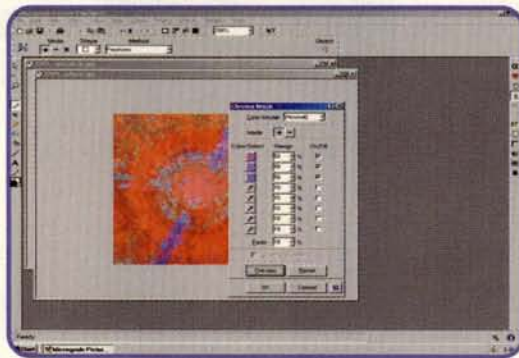
When it comes to operations like correcting the colour balance, or brightness and contrast, Picture Publisher provides two options. There is the visual method used by PhotoImpact (multiple thumbnails, each a different variation on the original), or a 'joystick' method, which lets the user 'move' the colour or tone values in precise numerical increments. The only criticism we would make of these features is that they appear on the 'Map' menu, which is not exactly an obvious place to look.

In our second test, Picture Publisher performed well in the first part — removing the moiré and then isolating the sky. For that second step we used the Chroma Mask feature, which allows the user to specify between one and 10 colours (which you sample from the image), which are then masked. For each sampled colour, you specify the precision with which it is to

be selected and can preview the result as you go. The Chroma Mask is further enhanced by the 'remove holes' feature, which will automatically delete any gaps within a mask. The combination of these two features — both unique to Picture Publisher — made selecting the sky simple.

However, we were less impressed with the process of inserting a new image into the selected area, which seemed unnecessarily cumbersome. Picture Publisher (like most of the other programs) failed badly when it came to the torture test of isolating the dark figures from their background. We found the only way to do this was by using a combination of Chroma Masking, magicwand selection and manual drawing — all of which took considerable time and patience.

Like its rivals, Micrografx has laboured hard to add innovative Web design features to this version of Picture Publisher. These include the almost ubiquitous bevel and drop shadow effects, so we had no problems completing the text element of



our second test. However, the Bevel Factory feature would be even more useful if it worked a little faster and if you could save and reuse predefined bevel styles (the way you can with some third-party plugins, such as Eye Candy 3). Saving and reusing drop shadows would also be handy if, for example, you were creating a series of Web buttons. The inability to save effects is a particular nuisance because, unlike the equivalent effects in Photoshop, Picture Publisher's effects have to be re-created if you change the text.

■ <b>Distributor</b>	Tech Pacific
■ <b>Phone</b>	(02) 9381 6000
■ <b>Price</b>	\$199
■ <b>Online</b>	<a href="http://www.micrografx.com/">http://www.micrografx.com/</a>
■ <b>In short</b>	Most of the features of the professional tools for a tiny fraction of their cost. Great value for money as long as you don't need to process lots of really large files.

## PhotoImpact 4

ULEAD

PhotoImpact is pitched at a rather different market than programs like Photoshop. Ulead emphasises its compatibility with Microsoft Office applications, which suggests that it is intended for occasional or inexperienced users rather than full-time professional designers. The program is certainly noticeably faster than some of its heavyweight rivals; its times for both opening and applying the unsharp mask filter to our first test file were among the quickest. In fact, it beat all the other products reviewed when it came to opening the file, and only Photoshop was faster at unsharp masking.

Given its market, it's not surprising that PhotoImpact's designers have given considerable thought to making it easy to use. For example, when it comes to adjusting the colour and tone balance of an image, PhotoImpact presents the user with thumbnails showing a range of options that vary relative to the original image — darker and with higher contrast, lighter and with higher contrast, and so on. You can accept an option, or click on one of the thumbnails to make it the starting point for a new range of selections. This is easy and fairly intuitive for a first-time user, and it doesn't restrict a more experienced one, because the precise numerical values of each option are displayed as you browse through them and any chosen setting can be saved and reused.

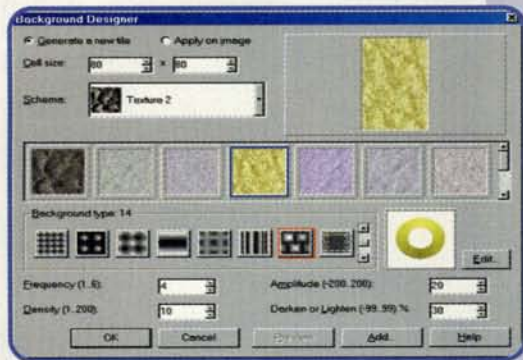
Another example of Ulead's intelligent approach to making the program easy to use is the colour correction facility. In addition to the thumbnail view, which works like the brightness and contrast dialog, there's a 'smart' option which allows the user to sample a colour in the image and then specify what it ought to be. For example, if the skin tones in a picture are too pale, you can specify a deeper colour and PhotoImpact will shift the whole colour range in the appropriate direction. We found it took some trial and error to get the balance right, but it's an approach that's undoubtedly easy to master.

Among the many common image enhancement tools in PhotoImpact — such as a filter for removing the 'red eye' effect associated with flash photography — is a 'remove moiré' filter. This made the first step of our second test straightforward. However, selecting the sky in the image and replacing it was harder, because the magic wand tool is slightly



sluggish and inaccurate by comparison with the same tool in Photoshop. It took considerable effort to select the area we were after, and the whole process took more than twice as long as in Photoshop. The magic wand selection tool wasn't the only one we found unresponsive. For some odd reason, drawing a simple rectangular selection was quick, but adding another rectangle to it was painfully slow.

When it came to our more challenging selection problem — the dark figures on



the dark background — PhotoImpact struggled even more than its competitors. It simply proved impossible to restrict the range of colours that the magic wand isolated, even with the sensitivity setting on its lowest value. This, combined with the annoyingly slow pace at which the selected areas were displayed, made it impossible to complete our second test.

However, the text element of the second test created no problems. Version 4 of PhotoImpact has many new features created especially for Web designers, including the ability to give any shape bevelled, button-like edges with text, and extensive drop shadow effects. Other Web-oriented tools include SmartSaver, which allows you to experiment with assorted options for exporting GIF, JPEG and PNG files. There's also a handy background designer which presents a massive collection of pre-designed background tiles and textures, all of which can be customised. And there's a separate GIF animation program which is very clean and easy to use, but lacks the advanced features of programs like Adobe's ImageReady.

- **Distributor** Lako Vision
- **Phone** (03) 9852 7444
- **Price** \$199
- **Online** <http://www.ulead.com/>
- **In short** A well-designed program that's easier to use than some of the more expensive software reviewed here, but it tends to choke on large files.

## MetaCreations Painter 5

MetaCreations Painter (formerly Fractal Design Painter) is one of those rare pieces of software that genuinely deserves the epithet 'unique'. Its major claim to fame is its ability to accurately mimic traditional art methods and materials while providing the power and flexibility of electronic image creation.

A good example of Painter's approach is its 'cloning' brush tools. To use these you normally start with a photographic image, such as a scan or digital photograph, but you could use any bitmap. Then you create a clone of the image, a new image window that is electronically linked to the original, and delete the clone image and switch on the 'tracing paper' in the clone window. This gives you a ghosted image of the original scan to use as a guide. Then select a cloning brush — these include effects such as 'impressionist cloner' (which creates small dabs of colour) or 'oil brush cloner' (which emulates oil paint) — then paint, using your traced image as a guide. The cloning



brushes sample the underlying image, and apply its colours and shapes to the new one, but the brush you've selected acts as a special filter, transforming the underlying image into impressionistic dabs or smeary oil paint.

The difference with the standard impressionist or oil paint filters that you might get in a program like Photoshop is that you can paint the newly filtered image selectively. If you have a pressure-sensitive digitising tablet — virtually an essential tool if you're to get the most out

of Painter — you can specify how the changes in pressure affect the final image, by varying the brush stroke or its degree of transparency, for example. Of course, you can also combine several cloning brushes in a single image, so that some parts of the original image are sampled coarsely, others with greater precision. And as you paint you can use the 'soft cloner' to selectively restore the original image, so that you can combine near-photographic images with very expressive, painterly ones — and all of this without having to mask or select different portions of the image to apply different effects to each one (although, of course, you can do that as well).

Among the new features in this version of Painter are the Super-Cloners brushes, which allow the user to select several points in a source document and apply various geometric transformations to them, such as rotate and scale, or perspective distortions.

However, cloning is just one of the many Natural-Media brushes that Painter has to offer. There are also extensive brushes, pens, felt tips, pencils, chalks, crayons, watercolours and oils. All of them are pressure sensitive and can be customised almost indefinitely by varying all the characteristics of the stroke and then saving selected combinations. Many brushes, such as chalks and pastels, are sensitive to the underlying texture of the paper, and Painter includes a similarly massive range of pre-defined paper styles, all of which can be customised to create infinite possibilities.

And if all of that isn't enough to fire your creativity, there is the fabulous Image Hose (that lets you spray images onto your picture); support for standard Photoshop plug-ins and filters; tools for creating imagemaps; and seamless background tools and animation tools for creating AVI and QuickTime films as well as animated GIFs.

- **Distributor** Scholastic New Media
- **Phone** (02) 4328 3555
- **Price** \$599
- **Online** <http://www.metacreations.com/>
- **In short** A unique tool that's designed more for creating original art than editing existing images, but it needs a pressure-sensitive digitiser to really get the most out of it.



# Put

# your name

## on the Net

## for less than

## \$1 a week\*

### NEW Web Hosting Package

**N**etRegistry, Australia's leading domain name specialist, can show you how to get your business name on the Internet for just \$199 set up fee and from only \$50 a year.

By putting just your name on the Net, you'll have an address that belongs to you and reflects your own identity. Which is a very important step to gaining prominence for your business on the Net.

### NetRegistry Domain Name Packages

incl. customisation of web site address eg. [www.yourname.au.com](http://www.yourname.au.com)

<a href="http://yourname.au.com">yourname.au.com</a>	<b>\$199 once only set up fee</b>	+ \$50 p.a. Domain Name Authority fee
<a href="http://yourname.com.au">yourname.com.au</a>		+ \$125 two year fee
<a href="http://yourname.net.au">yourname.net.au</a>		+ \$125 two year fee
<a href="http://yourname.com">yourname.com</a>		+ \$125 two year fee, then \$62.50 p.a.
<a href="http://yourname.net">yourname.net</a>		+ \$125 two year fee, then \$62.50 p.a.
<a href="http://yourname.org">yourname.org</a>		+ \$125 two year fee, then \$62.50 p.a.

**W**ith the new **au.com** domain name ending, you can have any name you want, on a first-come, first-served basis. In just 30 minutes, you can have a customised business Internet address.

That's why **au.com** is Australia's fastest growing commercial domain ending.

And to make things even easier, NetRegistry's web site has a **FREE SEARCH TOOL** so you can quickly find out if your name is available.

Call us or check out our web site and we'll show you how to put your name on the Net for \$1 a week\*.

**A**sk us about our great value Professional Email and Web Hosting packages, too.

If you are a PISP or Reseller please call us about the NetRegistry Partner Program.

\*after initial set up fee

### au.com

*"We couldn't get 'insurancebroker' with Melbourne IT, then found out we could with au.com. We said to our ISP, 'You should let all your customers know about the opportunities with au.com. It would be a great service to offer them.'"*

Wayne Dorgan, Director,  
Corporate Insurance Management Group

*"I do think that alternative names should be available, so I do encourage the development of the 'au.com' domain."*

Jon Postel, Director,  
Internet Assigned Numbers Authority (IANA)



NetRegistry

### Web Hosting

**T**he NEW Web Hosting Package from NetRegistry gives you phenomenal speed, a massive 50Mb of webspace as standard, your own domain name, customisation of employee email addresses, email redirection and free support.

**A**ll for just \$149 set up and \$59 a month fee (plus the Domain Name Authority fee listed opposite).

NetRegistry uses ZEUS professional web server software which has "shattered the world record for web server performance" and "comes out on top, beating Netscape Enterprise v.3.5.1, Microsoft II v.4.0, Apache v1.3 and Sun Web Server v1.0" according to 'Network Computing' magazine (Germany), July '98.

ZEUS also creates a CGI sand-bin for each virtual server allowing customers to install their own CGI's directly onto the server.

And to further ensure your web site is incredibly fast, our servers are located on the Australian Internet backbone.

Added to this, you will be dealing with an Australian operation that provides dedicated and expert advice on web hosting, with systems second-to-none.

Why not give your name and web site prominence on the Net.

Call NetRegistry on 1800 788 082 or check us out at our web site.

## Call 1800 788 082

## [www.netregistry.au.com](http://www.netregistry.au.com)



*Rounding up consumer systems from the multinational vendors wasn't as easy as we first anticipated. By APC staff*

## Consuming interest

**T**he first casualties were Compaq and Hewlett-Packard. Representatives from both companies said they were between product lines, and couldn't provide us with relevant systems in time for review.

Fair enough. We still had six heavyweight invitees, sure to jump at the chance of publicity in Australia's leading computer magazine. The APC Labs guys were enthused by the chance to look at PCs from Acer, Dell, Gateway, Packard Bell, IBM and Apple, as it's been a while since we've compared their consumer-level machines. Then Packard Bell declined, as it too was bringing out new models which wouldn't be ready in time.

Fortunately, four PCs did arrive for testing, although we'd just finished running Ziff-Davis' Winstone 98 tests on the Dell offering when a company official rang us to say that Dell would have to withdraw from our tests. By our publication date the model in question would have changed processors from a 333MHz Pentium II to a Celeron and added new options.

Then there was Apple. Its new iMac — with super-sleek styling and emphasis on ease of use — falls squarely into the brand-name consumer PC category. Although it was too early to get our hands on one, we've done our best to compare it with the PCs (see 'A fresh Apple', page 122).

### And then there were three

So what's going on? These are eight of the 10 biggest PC vendors in Australia. Are they scared of APC? Don't they have confidence in their consumer machines?

Forget conspiracy theories. The truth is that product cycles are now so short for these companies that often by the time we've reviewed a machine and published the results, it's been superseded. But keeping such products away from comprehensive third-party testing can result in consumers not being fully aware of the differences between clones and brand names. Even if its performance isn't great, APC may



still commend a PC for its build quality, its value for money and any added extras (which are usually more of a constant).

Often at the consumer level, a PC is a PC. This is where brand reputation can make a difference — a buyer may not know much about technology, but they may have heard horror stories about clone vendors and dubious warranties. On the other hand, companies like Compaq and IBM don't look like they're about to disappear, and for someone without good PC knowledge this can be a great comfort.

But does the backing of a big company really offer value for so much extra money? After looking at these machines we're tempted to answer 'no'. While we can tell you which PC topped our review, for the prices quoted they were all pretty far from the performance and feature sets of competing clones. You'll have to decide whether the warm and fuzzy feeling you get from the brand's stability is worth the sacrifice.

### Logistics

Multinational PC vendors often face the problem that before they can begin selling new systems they must clear existing inventory, which can be significant. On the other hand, build-to-order companies — such as Dell and Gateway — can clear

the decks relatively easily. Multinationals also run large marketing campaigns that bring significant time and fiscal investments to a single product line, while a clone vendor may simply place an advertisement in a local newspaper to publicise its latest configuration.

The brand-name PC vendors are quick to tell us how good their PCs are, how much market share they'll capture, and how pathetic the competition is. To that end we had hoped they'd make a special effort to furnish us with the kind of consumer machines found on the shelves at Harvey Norman and Grace Bros — the sort of systems rarely subject to comparative reviews.

The minimum specifications we set for the brand-name consumer PCs featured here were: Intel Pentium II 233MHz processor or equivalent, 32M of RAM, CD-ROM drive, soundcard, 3D-capable graphics card, 15in colour monitor, Microsoft Windows 95 operating system, mouse and keyboard. Except for some minor variations, that's pretty much what we got — they're just a bit thin on the ground.

What about the PCs we didn't examine for the reasons mentioned above? At the time of review, Compaq's consumer lines included 300MHz AMD K6 or Pentium II processors with 32M to 48M of RAM. Packard Bell offered 266MHz Pentium IIs or 300MHz Celerons. Hewlett-Packard was using 266 or 300MHz Intel processors with 32M of RAM. By the time you read this, standard consumer PCs will contain 333MHz Pentium II or 333MHz Celeron (as with Dell) processors, and more will include 64M of RAM. PCs with 450MHz Pentium II processors will be appearing, and the new Celerons will have 128K of L2 cache (current Celerons have none). Companies may also adopt the new K6-2 processor from AMD, which has groundbreaking 3D capabilities for games (see APC August, page 31).

Here's hoping that next time we get the consumer PC urge, the brand names will respond as never before.



## Aspire T5134

### ACER

Acer clearly thought a great deal about the novice computer user when putting together the T5134 package. This is the easiest computer I have seen to take out of the box and set up. All the connectors at the back are clearly labelled, and the system comes with a large instruction sheet that has concise instructions and large diagrams. In case you get stuck, there is a sticker on the side of the case with the phone number and opening hours for Acer's technical support help line.

The case itself has a minimalist design, with an elegant wave-shaped curve to the front. One of the side panels has a cluster of small holes on it; I am not sure if this was a styling consideration, or intended to improve airflow. The mouse and keyboard are both very comfortable to use.



A 333MHz Pentium II processor with a 512K secondary cache powers the T5134. The system we tested came with 32M of SDRAM, which may not be enough for some applications. However, Acer officials told us that by the time this article is published the T5134 will ship with 64M of RAM for the same price. As expected, it scored highest in the Ziff-Davis CPUmark32 test.

The 4G Quantum Bigfoot hard disk drive is large enough for most users, although some may prefer more storage space. The hard disk drive is also less than ideal in terms of performance, coming last in both the Ziff-Davis Business and High-End Disk WinMark 98 tests. By contrast, the 32x Acer CD-ROM topped the Ziff-Davis CD-ROM WinMark 98 test.

Although the ATI 3D Rage Pro on-board display system with 2M of SGRAM doesn't look impressive on paper, it scored highest in both the Ziff-Davis Business and High-End Graphics WinMark 98 tests. The graphics performance is nicely complemented by a 15in AcerView 54eL monitor.

To complete the package, Acer has included a 56K internal voice-capable

Magic MP56 modem, which also acts as a soundcard. Combined with Altec Lansing-powered speakers, this system has a pleasant sound.

Overall performance, according to the Ziff-Davis Business Winstone 98 results, was very close to the bottom end of the systems we tested. This machine was soundly beaten by Gateway's product, even though the Gateway has the same amount of RAM, a slower processor and costs \$300 less.

Considering the \$2,999 price tag, you would expect a larger hard disk drive and more than a one-year, return-to-base warranty. Although this computer is very easy to set up and use, it seems a steep price to pay for user friendliness.

**Josh Mehlman**

- **Distributor** Acer Computer Australia
- **Phone** (02) 9870 1999
- **Online** <http://www.acer.com.au/>
- **Price** \$2,999
- **In short** Very easy to set up and use, but not great value.

## G6 300

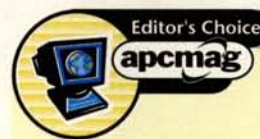
### GATEWAY

Similar to the Acer system, the Gateway's case has a sleek, minimalist design with graceful curves. The case is also easy to open and has large screws that can be undone by hand. Although this system has two bays for extra storage devices such as CD-Rs or Zip drives, these are hidden behind a panel that must be removed entirely in order to get to them. Removing the panel does not improve the case's appearance, and the panel is easy to lose or break once it has been removed.

Under the bonnet is a 300MHz Pentium II processor with a 512K cache and 32M of SDRAM. As expected, it was beaten by the 333MHz Pentium II Acer system in the Ziff-Davis CPUmark32 test, although not by a very large margin.

This system is let down by its graphics performance. The STB Mpact 2 3D adapter is built into the motherboard and comes with 4M of DRAM. It came third in the Ziff-Davis Business Graphics WinMark 98 test, and second in the Ziff-Davis High-End Graphics WinMark 98 test. The 15in Gateway EV500 monitor doesn't help — its display flickers a lot initially, although it eventually settles down.

The Gateway's hard drive performance was the best of all the systems reviewed. Gateway's 8.4G IBM hard drive beat the other two systems by a significant margin in both the Ziff-Davis Business and High-



### EDITOR'S CHOICE

#### ● Gateway G6 300

The Gateway G6 300 is good value for money in a category where the price seems to depend more on the label outside the box than what is inside. This is a powerful, no-nonsense machine with a relatively large hard disk drive and a strong focus on disk and processor performance. And it still includes the graphics and sound capabilities demanded by home users.

It is fairly safe to assume none of these manufacturers is about to go under, yet Gateway is the only manufacturer to offer more than a one-year warranty. Gateway has shown a good understanding of the consumer market in this case; the three-year warranty will satisfy even the most nervous first-time user.

End Disk WinMark 98 tests. The 32x CD-ROM's results in the Ziff-Davis CD-ROM WinMark 98 test were quite low, and were actually closer to what you would expect from a 24x CD-ROM.

The onboard Ensoniq Audio PCI sound system coupled with GCS-100 speakers sounds reasonably good, but there is a slight background hiss if the speakers are turned up.

Gateway has made sure you will have very little trouble using this computer straight out of the box. All the connectors at the back are clearly labelled and colour-coded. It comes with Microsoft Office 97 already installed, along with a voucher for an upgrade to Windows 98.

This was the cheapest system at \$2,698 and it represents good value for money. The three-year warranty on parts and labour (one-year onsite, two-year return-





# Xeon

440 GX/BX

100 MHz System Bus + 2 GB Main Memory + AGP

66 MHz System Bus

START

Why take chances with low cost unknown components inside your PC. You deserve the best, not just a fancy overseas badge. At Beyond, we only use the world's best branded components in our award winning SuperO systems. Together with ISO 9002 Quality Endorsement, it is your guarantee of performance, compatibility and reliability.



### Beyond SuperO Professional

Intel 300MHz Pentium II Processor  
Option: 333/350/400/450MHz CPU  
USA SuperMicro SLA LX Mainboard  
Diamond Stealth 4400 4MB AGP Video  
NEC 15" V500 MultiSync Digital Monitor  
Quantum 2.5GB Ultra DMA HDD  
32Mb SDRAM  
Beyond Ergonomic 104 Keyboard PS/2  
Beyond SuperO Midi Tower ATX Case  
Logitech PS/2 Mouse  
Teac 3.5" Floppy & 32X CD ROM IDE  
Microsoft Windows 98 and IE 4.0

**\$1890**

**\$2830**

### Beyond SuperO Velocity

Intel 350MHz Pentium II Processor  
Option: 400/450MHz CPU  
USA SuperMicro SBA BX Mainboard  
100MHz Bus Speed  
64Mb SDRAM PC-100 100MHz  
Matrox Productiva G100 8MB AGP Video  
LG 15" Multimedia Digital Monitor  
Quantum 5.1GB Ultra DMA HDD  
Beyond Ergonomic 104 Keyboard PS/2  
Beyond SuperO Midi Tower ATX Case  
Logitech PS/2 Mouse  
Creative Sound Blaster AWE 64 Audio  
Option: Voodoo II 8M 3Dfx Accelerator  
Sony 3.5" Floppy & 32X CD ROM IDE  
Microsoft Windows 98 and IE 4.0

### Beyond SuperO Speedo

Intel 333MHz Pentium II Processor  
Option: 350/400/450MHz CPU  
USA SuperMicro SLA LX Mainboard  
Matrox Productiva G100 4MB AGP Video  
Sony 15" Trinitron Digital Monitor 0.25  
Quantum 5.1GB Ultra DMA HDD  
32Mb SDRAM  
Beyond Ergonomic 104 Keyboard PS/2  
Beyond SuperO Midi Tower ATX Case  
Logitech PS/2 Mouse  
Sony 3.5" Floppy & 32X CD ROM IDE  
Microsoft Windows 98 and IE 4.0

**\$2380**

### Beyond SuperO XeonServer

Intel 400MHz Pentium II Xeon Processor  
Option: 450MHz CPU  
USA SuperMicro S2DGU GX Mainboard  
with Dual Xeon Processor capacity and  
Adaptec 7890 Dual Channel Raid SCSI  
Ultra 2 Wide 80MB/s transfer rate  
Seagate 4.5GB Ultra 2 Wide SCSI HDD  
100MHz Bus Speed, 2GB RAM Capacity  
128Mb SDRAM PC-100 100MHz Bus  
Teac 15" Digital Monitor  
Beyond Ergonomic 104 Keyboard PS/2  
Beyond SuperO Tower Server ATX Case  
Option: Fault Tolerance Chassis with  
Dual Hot Swap 300W Power Supply  
Teac 3.5" Floppy & 32X CD ROM IDE  
SMC EtherPower II 10/100 Lan Card  
Microsoft NT Server with 5 Users Licence

**\$6980**



# Beyond



"Beyond has won more "Editor's Choice" awards than any other Australian computer companies. A total of 20 independent major awards were won in 1995/1996/1997/1998 from various national computer journals. Beyond systems can be customised to best suit your requirement. All Beyond computers have been tested and certified as Year 2000. As one of the top Australian computer manufacturers, Beyond is a quality endorsed company under ISO 9002. \*Delivery is in addition to the advertised prices shown. Free Iomega Zip drive is only available in SuperO series with limited offers. Certain configuration can not be downgraded. SuperO & Spirit series systems have two years parts and five years labor return to base warranty with optional three years on site. All logos and trademarks are the properties of their registered owners. E&OE.

Call: **02 9417 3688**  
(NSW, QLD, WA, NT)

Call: **03 9646 4388**  
(VIC, SA, TAS)



Quality  
Endorsed  
Company  
ISO 9002:2000  
Manufactured by Beyond

Call Beyond today, or do your On Line Quote: [www.beyondcomputers.com.au](http://www.beyondcomputers.com.au)



to-base) is the best of the systems reviewed. Overall it is a very good system for business applications, as shown by its triumph in the Ziff-Davis Business Winstone 98 test. Home users may prefer a computer with better graphics capabilities.

**Josh Mehlman**

- **Distributor** Gateway
- **Phone** 1800 500 734
- **Online** <http://www.gw2k.com.au/>
- **Price** \$2,698
- **In short** Unimpressive graphics, but low price, great warranty and fair performance.

## Aptiva EQ3

IBM

If you're thinking about buying an Aptiva, you really need to ask yourself how much extra you are willing to pay for a brand name.

The Aptiva's case instantly reminded me of a postmodern office building, with all its intersecting lines and interesting protuberances. The case design is not merely superficial; there is a convenient handle on the top to help you carry it around, and the cover is very easy to remove.

The Aptiva EQ3 comes with a 24x Acer CD-ROM that scored lowest in the Ziff-Davis CD-ROM WinMark 98 test, as expected. Considering the overall price of the system, it does not seem unreasonable to expect a 32x CD-ROM, which costs around \$10 to \$15 extra at current retail prices. The sound system is an onboard Crystal 3D SRS chip, the same chip you would find on a \$30 generic soundcard. The sound system quite obviously had trouble with demanding tasks, which is a shame because the TheatreSound 3D speakers sound quite good.

Although all the systems come with 56K modems, the Aptiva's is the only one that is not voice capable. The Aptiva's ATI 3D Rage II graphics adapter did not score well in the Ziff-Davis Business Graphics WinMark 98 test, and came last in the High-End Graphics test.

IBM no longer displays the 'Intel Inside' sticker on the Aptiva, opting instead for an AMD K6 300MHz MMX-Enhanced processor with a 256K secondary cache and 48M of SDRAM. This processor tested the lowest by far in the Ziff-Davis CPUmark32 test, scoring 550, compared with 772 for the 300MHz Pentium II in the Gateway system and 812 for Acer's 333MHz Pentium II. The low test result is at least partially due to the smaller secondary cache. IBM has used the same hard disk drive as Acer, a 4M Quantum Bigfoot TX4. It scored slightly higher

## How we tested

When testing these brand-name consumer PCs, we used the Ziff-Davis suite of desktop PC benchmark software, including the Winstone 98 and WinBench 98 applications. We also tested the systems for year 2000 compliance. To do this we used the National Software Testing Laboratories (NSTL is at <http://www.nstl.com>) YMARK2000 hardware compliance testing program. This piece of software analyses the relevant aspects of a computer system and reports whether the hardware is configured to be able to cope with the new millennium.

Winstone 98 runs a suite of modern business and high-end processor-intensive and graphics applications. The run of these applications is timed to measure how long the system takes to complete these tasks. The Winstone benchmark is split into two tests — the High-End Winstone 98 and Business Winstone 98.

Previous versions of the Winstone suite allowed us to run both the Business and High-End tests on systems that met the necessary memory requirements. Winstone 98, however, requires Windows NT 4.0 to run the High-End Winstone test, which tests the system using intensive graphics applications. All of the systems tested ran Windows 95, therefore we did not run the High-End Winstone test application.

The Business Winstone result is a comparative score of how fast the computer could complete the various business applications.

**WinBench 98** contains a set of subtests designed to find out how fast each component of a PC really is.

**Business and High-End Graphics WinMark 98** measures the system's

graphics performance when performing video tasks associated with common business applications, as well as demanding multimedia and 3D applications.

**Business and High-End Disk WinMark 98** provides a measure of how a system's hard disk subsystem handles a load equivalent to that demanded by the business applications used in the Business Winstone 98 test. Note that some systems use the Intel Bus Master driver to improve hard disk performance. This driver under some circumstances inflates the Disk WinMark figure, providing an inaccurate result.

**CPUmark32** lets us compare how fast the processor, memory and cache subsystems are.

**CD-ROM WinMark 98** tests the CD-ROM drive, adapter and software drivers. The result is an overall measure of how fast the CD-ROM components transfer data.

All of the systems tested were shipping versions available to the general public, unless otherwise stated. Because of the lead time between testing the machines and publication, please note that some specifications and pricing may have changed. Be sure to check this information with the vendor before purchase.

These tests were performed without independent verification by Ziff-Davis and Ziff-Davis makes no representation or warranties as to the results. WinBench and Winstone are registered trademarks of the Ziff-Davis Publishing Company. These benchmarks are available for you to try and buy at the Ziff-Davis Web site at <http://www.zdbop.com>.

than the Acer in the Ziff-Davis Business and High-End Disk WinMark 98 tests, perhaps owing to the ALi chipset on the Super Socket 7 motherboard. It did not perform as well as the 8.4G drive in Gateway's computer.



The Aptiva comes with quite a lot of software already installed, including Lotus SmartSuite, IBM AntiVirus and PC Doctor diagnostic software. Although it costs \$100 more than the Gateway system, it has a much smaller hard drive and its only advantages over the Gateway are additional RAM and the fact that it is made by the world's only 87-year-old computer company.

**Josh Mehlman**

- **Distributor** IBM
- **Phone** 132 426
- **Online** <http://www.pc.ibm.com/au/>
- **Price** \$2,799
- **In short** IBM's reputation might justify the price tag, but the combination of components does not.



## DriveCopy™

**The easiest way to copy your old drive to your new drive in minutes.**



Upgrading to a new high capacity hard drive used to be a painful process until now. With just a few simple steps, DriveCopy copies everything from your old hard drive to your new hard drive without losing a single preference, setting, or byte of data. There's

no reinstalling, no data loss, no headaches. It's never been simpler or more affordable to upgrade to a new hard drive.

## PartitionMagic™

**The revolutionary utility that lets you create, resize, and move hard-disk partitions on the fly.**



Up to 40% of your hard drive may be wasted space due to inefficient storage methods. Reclaim up to hundreds of megabytes of wasted disk space with PartitionMagic.

Running Windows 3.1, Windows 95, and NT on the same machine is now safe and easy with PartitionMagic. And Boot Manager makes switching between them a snap.

# Power Tools from PowerQuest™

## Drive Image™

**The fastest, easiest tool for complete hard-drive imaging.**



With Drive Image, you can quickly and easily create and store a compressed image file of your entire hard drive, or just the partitions you specify, on a JAZZ®, Zip®, network or second hard drive. Backups become quick and easy, and complete system restoration is a breeze. Create an image

of your old hard drive to configure your new drive! No reinstallation necessary. Drive Image's patent-pending SmartSector™ technology works two to three times faster than conventional imaging methods so you save time, money, and a lot of aggravation.

## Drive Image™ Professional

**The fastest way to clone workstations.**



The process of cloning workstations is finally quick and easy. Download a stored image file to configure a new workstation in minutes, saving hours of installation time. You can even swap partitions between image files as well as create, resize, and move partitions without destroying data. No other product can give you such freedom and flexibility to customise image files to meet the needs of individual workstations.

**For more information on any of these fine PowerQuest products contact your local reseller or visit our Web site at [www.powerquest.com](http://www.powerquest.com).**

City Software • Corporate Software • Downtown Software • Harvey Norman • International Software Warehouse  
Propeller Head • Soft Solutions • Software Direct • Software Express • The Software Shop

© 1997 PowerQuest Corporation. All rights reserved. PowerQuest and PartitionMagic are registered trademarks of PowerQuest Corporation. Drive Image, Drive Image Professional and DriveCopy are trademarks of PowerQuest Corporation. Patents pending.

POWER®  
**PQ**  
QUEST



## Specifications: Brand name PCs

Product	Acer Aspire T5134	Gateway G6 300	IBM Aptiva EQ3
Distributor	Acer Computer Australia	Gateway	IBM
Phone	(02) 9870 1999	1800 500 734	132 426
Fax	(02) 9878 6227	(02) 9641 2660	(02) 9354 7766
Price	\$2,999	\$2,698	\$2,799
Online	<a href="http://www.acer.com.au/">http://www.acer.com.au/</a>	<a href="http://www.gw2k.com.au/">http://www.gw2k.com.au/</a>	<a href="http://www.pc.ibm.com/au/">http://www.pc.ibm.com/au/</a>

### Testing configuration

Processor	Intel 333MHz Pentium II	Intel 300MHz Pentium II	AMD K6 300MHz MMX-Enhanced
L2 cache	512K	512K	256K
RAM/type	32M SDRAM	32M SDRAM (PC100)	48M SDRAM
Maximum RAM	384M	256M	384M
Hard disk drive	4.0G Quantum Bigfoot	8.4G IBM DHEA-38451	4.0G Quantum Bigfoot TX4
Hard disk controller	Intel 82371AB/EB PCI Bus Master IDE Controller	Intel 82371AB/EB PCI Bus Master IDE Controller	Ali Bus Master PCI to IDE Controller
Hard disk file system	FAT32	FAT32	FAT32
Video bus type	AGP	AGP	AGP
Video adapter	ATI 3D Rage Pro	STB Mpack 2 3D	ATI 3D Rage II
Video RAM size	2M	4M	2M
Video RAM type	SGRAM	Rambus DRAM	SGRAM
Video controller chip	ATI 3D Rage Pro	Chromatics Research Mpack 2	ATI Rage II
Graphics driver name and date	macxw4.drv (4.10.01.2278)	m2gfx.drv (4.10.01.3073)	macxw4.drv (4.03.00.2162)
Monitor	15in AcerView 54eL	15in Gateway 2000 EV500	15in IBM 2124
CD-ROM drive speed	32x	Min 13x/Max 32x	24x
CD-ROM drive model	Acer	Mitsumi FX320S	Acer MTRP
Brand of soundcard	Magic MP56 3D Audio	Ensoniq AudioPCI	Crystal 3D SRS
Operating system (bundled)	Windows 95B	Windows 95B	Windows 95B

### Features

Internal modem	Magic MP56 modem (data/fax/voice/speakerphone)	Sportster Winmodem 56K	LT 56K Winmodem
Keyboard	Standard 101/102-key	104-key Windows 95	Standard 101/102-key
Mouse	Standard PS/2	MS PS/2 IntelliMouse	Standard PS/2
Bundled software	Lotus SmartSuite, WorldBook Multimedia Encyclopaedia, Redline Racer, G-Police	MS Office 97 (SBE)	Lotus SmartSuite 97, IBM AntiVirus, PC Doctor, IBM Update Connector
Speakers	Altec Lansing amplified speakers	GCS-100 performance amplified speakers	TheatreSound 3D
Warranty	1 year RTB parts and labour	3 years (1 year onsite, 2 years RTB) parts and labour	1 year onsite parts and labour
Y2K compliant	Yes	Yes	Yes
Other	Modem speaker microphone	Modem speaker microphone, Telstra Big Pond Internet Kit	

### Benchmarks

Business Winstone 98	18.47	20.63	18.33
CD-ROM WinMark 98: Overall	1,733.33	1,556.67	1,350
CPUMark32	812	772	550.33
Business Disk WinMark 98	906	1,380	939
High-End Disk WinMark 98	2,533.33	3,783.33	2,736.67
Business Graphics WinMark 98	146.33	93.13	105.67
High-End Graphics WinMark 98	179	146	130

1. All products used in these tests are shipping versions available to the public at the time of publication unless otherwise stated.
2. The above specifications refer to the actual machines tested by APC Labs. Check with the vendor for the latest components.
3. Winstone, WinBench and associated programs are registered trademarks of the Ziff-Davis Publishing Company.
4. These tests were performed without independent verification by Ziff-Davis, and Ziff-Davis makes no representations as to the results.
5. The use of the Intel BusMastering hard disk driver on systems using Ultra DMA hard drives may report incorrectly high scores in the Ziff-Davis WinBench Business Disk WinMark and High-End Disk WinMark tests. Some of the systems in this review may report such results.
6. The systems were tested under a screen resolution of 1,024 by 768 pixels with 256 colours, and a refresh rate of 60Hz, except the IBM Aptiva, which was tested at 1,024 by 768 pixels with 64K colours.

## The alternative is back

# A fresh Apple

Under the guidance of interim CEO Steve Jobs, Apple is now back in competition with PC manufacturers for the consumer dollar, at the same time as its traditional DTP and education niche markets are being absorbed by Windows.

Apple's new consumer solution is the iMac, a system remarkable for its appearance and for the innovation of the engineers who created it.

The iMac is powered by a 233MHz G3-series PowerPC processor. Buyers should beware of judging a processor only by its clock speed — the 233MHz G3 is an easy match for Pentium II 300MHz systems. That processing grunt is backed up by a 512K Level 2 cache and 32M of SDRAM, expandable to 128M.

The translucent, blue-and-white, all-in-one case stylishly encloses a 15in Shadow-mask tube, which is capable of 1,024 by 768 display. The traditional SCSI bus has been replaced with an internal EIDE interface for the 4G hard disk and 24x CD-ROM, and two USB ports provide external connectivity.

The iMac ships with a 56K modem, but strangely there is no floppy drive. Apple has instead opted for a CD-ROM and networking via a 10/100BaseT adapter. It is brave of Apple to assume that the lack of removable media and expandability options won't mean it will be shunned by the masses.

Although there are no existing USB peripherals to use with the iMac, announcements made at the July US Macworld Expo by Epson, Hewlett-Packard, Canon, LaCie, Kodak and Connectix signals strong developer support. The planned USB hard drives, floppy drives, DVD drives, cameras, printers and games controllers should not be far off. In the meantime, companies such as Hewlett-Packard are offering Connections Kits that allow older Mac peripherals to be used with the new USB ports.

Basically this product has levelled the playing field for Apple by removing many of the reasons not to buy a Mac.

At the time we went to press, the iMac was slated to be available locally early this month for \$2,795. For more information contact Apple on 1300 300 755, or go to <http://www.apple.com.au/>.

Ari Weisz-Koves



*Saving data to cheap media using CD-Rs is becoming an increasingly popular option for users. By Philip Moore*

# On the record

**I**t wasn't long ago that CD-Recordable drives (CD-Rs) were specialist items used only by major content producers and audio studios. They were expensive and bulky, and required a certain level of technical knowledge to use. Gradually they became more and more attainable, developing from external SCSI devices used mainly by industry and commercial concerns, to internal, easy-to-use drives well within the budget of small business or home users. There are now even ATAPI/IDE models available — such as the Kodak one we tested — which don't require a special SCSI interface and can be installed as easily as a standard CD-ROM drive.

With this ease of use and affordability, CD-R technology is being used for a wide range of purposes. For backup and archiving data, a CD-R is the cheapest solution around — cheaper per megabyte than floppy or Zip disks or even tape. A blank CD-R disc costs only a few dollars, and is more reliable than a floppy or Zip disk. A CD-R disc can hold up to 74 minutes of audio or around 650M of data.

Other uses include mastering for CD-ROM production, creating a one-off master for presentations, or as a personalised tool or emergency disc. And of course you can create audio CDs as well. Most CD-R software now allows you to create an audio CD from WAV files (each file becoming a track), or to copy directly from an existing audio CD. Note that duplicating a music CD in this manner for anything other than personal use is in breach of copyright, and these programs will remind you of this. While APC cannot condone this, the fact is that the technology is there and very easy to use.

A CD-R drive will also double as a regular CD-ROM drive, though none are as fast as the standard 24x or 32x drives on the market. This is why CD-R drives have two speed ratings. The highest speed indicates how fast a CD-ROM (reader) drive it is (6x, 8x or 12x), while the lower figure is for how fast it can 'burn', or write, a CD-R disk (no more than 4x at present due to data throughput limitations).

Copying files to a CD-R is not quite the



same as copying them from, say, a hard drive to a floppy disk. Specialist CD-R software is required to prepare the files into the proper structure before 'burning' a CD-R disc. Generally speaking, a CD-R disc can only be written to once. You cannot erase data from it; once it has been written to, it is permanent. You can, however, write to a CD-R disc in stages — called sessions — until the disc is full. The multi-session mode is useful for making incremental backups, but the process does end up wasting quite a bit of useful space, and is usually unreadable by a regular CD-ROM drive until the disc is closed and finished off.

Another method of writing data is called packet-writing, where it is possible to write files to the drive just as if you were copying them to any other drive — at any time — within a single session. But as a rule, the best way to write data to a CD-R is all at once. Fill it up as much as you can and close the disk off (so no more sessions can be added).

CD-RW drives (CD-Rewritable) use a more recent technology that allows users to write to and erase from a disc just like a regular removable disc. The discs look the same as a regular CD-ROM or CD-R disc and will play on a standard CD-ROM drive. However, they are substantially

more expensive (\$20 to \$30 at the time of publication) and can only be written to using a CD-RW drive. A CD-RW drive will also write CD-R, and work as a CD-ROM drive — three kinds of drive in one. For this feature, though, we chose to focus only on CD-R drives.

It is worth noting that different CD-R media can behave slightly differently in certain CD-R drives, depending on how the drives are calibrated. There are three basic types of CD-R media available; they use a slightly different chemical makeup commonly known as: Gold, Green and Platinum (or Blue). We used Platinum discs for our tests.

The CD-R specification is also designed with 2x writing in mind, so while we tested all drives at their maximum write speed (and all read back perfectly well), their quality may not have been as error-free as with 2x burn. We were unable to do a complete low-level test of how well each disc was written as this requires very expensive specialist hardware; even if we had been able to, the results can be erroneous on CD-R discs (as opposed to manufactured CD-ROM discs). Consequently we had no measure of BLER, E22, Eccentricity or other more technical measures of a disc's quality.■



**Digital Science 2801IDE****KODAK**

This drive is an 8x reader and 2x writer. That's not as fast as some others in this feature, but it is the only EIDE drive reviewed. This counts for something because although installing SCSI devices is not that hard, installing an EIDE drive is much more straightforward, and doesn't involve purchasing a separate interface card as the EIDE interface is on your PC's motherboard. The buffer size of 512K is adequate, though small compared to some of the other drives here, increasing



the possibility of buffer underrun (a situation where the drive can't keep up with the data flow and gives up, creating an unreadable coffee coaster).

It should be said that this didn't happen while we were testing this product, which comes with CeQuadrat's WinOnCD To Go software. This software, despite being a cut-down version, is still perfectly capable for most users' needs. Also included is PacketCD for packet writing, and two blank discs.

The Ziff-Davis WinBench 98 CD-ROM WinMark results for CD-ROM reading were average for an 8x, although its Access Time was rather slow at 215ms. It also tends to hog the CPU quite a bit, taking up nearly 58% while in use. But then, that's EIDE for you. We also had Intel Bus Mastering enabled during our tests.

Kodak does make excellent Gold CD-R discs, and presumably these are what would work best in this drive. Despite being rather slow and resource-hungry compared to others, the fact that this is an EIDE drive and requires no extra SCSI interface card or special setup makes it a good choice for the average consumer, at a reasonable price. By the time you read this there should also be a 4x write model available.

- **Distributor** Kodak
- **Phone** 1800 674 831
- **Online** <http://www.kodak.com>
- **Price** \$625
- **In short** The only EIDE drive in this roundup, and the only one to include the later version (4.5) of CeQuadrat's To Go mastering software. A good all-round package which is easy to install and use.

**Panasonic PW-7502****PANASONIC**

The PW-7502 is an 8x read and 4x write drive with a decent 1M buffer. It is an internal SCSI-2 unit, although the model we received came as a standalone drive — no software, no cabling and no SCSI adapter, so purchasers would need to obtain these separately if they didn't already own them. The drive alone costs \$599. Alternatively, it is available in a kit for \$899, including Adaptec Easy CD Pro Software, an Adaptec AVA-2904 PCI Host Adapter and two Gold CDs.

The product performed much better than the other 8x read drive reviewed — the Kodak — although this is due largely to the Panasonic being a SCSI device. In



the Ziff-Davis WinBench 98 CD-ROM WinMark benchmarking tests the CPU utilisation was significantly less (as was true of all the SCSI drives), and the access time was a creditable 184ms.

If you already have a SCSI setup it may be worthwhile buying the drive as is. However, the kit is good value for those starting from scratch.

- **Distributor** General Micro Peripherals
- **Phone** (02) 9540 5000
- **Online** <http://www.gmp.com.au/>
- **Price** \$599
- **In short** A reliable middle-of-the-road drive that can handle pretty much anything you throw at it.

**EDITOR'S CHOICE**

● **Smart and Friendly**  
**CD SpeedWriter**

The 12x read 4x write Teac drive included in this kit proved to be one of the fastest CD-ROM readers in the Ziff-Davis WinBench 98 CD-ROM tests, and its CD-R performance was equally reliable in tests with 1M of buffer memory. But what really gained this product the Editor's Choice award is the quality of the bundle for the price.

It may not be as affordable as the Kodak Kit, or (arguably) as reliable as the Plextor, but it does have more useful software than any other product reviewed here. It also comes with a reliable Adaptec SCSI Adapter card and cables, plus a labelling kit. The Smart and Friendly CD SpeedWriter provides you with everything you need to start burning your own discs.

**Plextor PXR412Ci****PLEXTOR**

Plextor tends to make high-end SCSI devices for professional users, and the \$856 cost of this drive reflects this. It is a 12x read and 4x write internal SCSI-2 unit, and is the only one reviewed with a generous 2M buffer. This helps ensure reliability during CD-creation — fewer coffee coasters. It is also the only drive to use the old-fashioned caddy for disc loading. (A caddy is a special CD holder; you put the CD in the caddy, and then put the caddy in the drive.) While a caddy can be a little bothersome, it does help protect the disc from dust particles and scratches.





# DataExpert Expands Your World

## ExpertColor 3D Multimedia Acceleration Card Series



- **DRG5R2C ATI Rage IIC**  
ATI's proprietary Multimedia Channel and utilities  
Highest compatibility and best graphics control
- **DIT5740 Intel740™**  
Superb 2X AGP outstanding 3D graphics performer
- **DVT5200 Rendition Verite V2200**  
Breath-taking Video, Graphics Acceleration!  
Picky game players' Choice.
- **DSV5366 S3 Trio 3D**  
"Business-Ready" Multimedia Accelerator  
Greatest 2D and adequate 3D for Corporate users!

## GLOBAL Multimedia Motherboard series



- **MBX8440 Intel 82440BX**  
Motherboard with state-of-the-art design and chipset.  
100% supported at 100MHz frequency.
- **MLX8440 Intel 82440LX**  
Advanced LX-board, Slot1 + AGP solution!
- **MEXm440 Intel82440EX**  
Sound on board -The most cost-effective solution.  
Micro ATX form factor.
- **MVP7598 VIA MVP3**  
100MHz Socket 7 + AGP solution in one!
- **MAL7542 ALi Aladdin V**  
100MHz Socket 7 + AGP solution in one!
- **MGX7520 Cyrix Media GXm**  
All-In-One solution for basic multimedia PC and  
Net PC users.





This kit comes with WinOnCD and Plextor Manager 96, and 10 blank CD-R discs. While it also has an audio cable for connecting the audio output of the drive to your soundcard, there are no SCSI adapter or SCSI data cables included.

With regard to the Ziff-Davis WinBench 98 CD-ROM read benchmarks, the Plextor was the least impressive of the 12x SCSI drives with a figure of 771K per second. However, its CPU utilisation was the least of all the SCSI drives.

However, CD-R capabilities are the important thing here, so even though it may be a slower CD-ROM drive, the 2M buffer and Plextor reliability count for a lot.

- **Distributor** SCSI Corp
- **Phone** (02) 9894 6033
- **Online** <http://www.plextor.com>

- **Price**
- **In short**

<http://www.scsi.com.au/>

\$856

The only drive that still uses a caddy and one of the slower SCSI drives in our benchmarks during playback. However, it comes with an impressive 2M buffer for reliable performance during CD-R creation.

## CD SpeedWriter

### SMART AND FRIENDLY

Another 12x read and 4x write internal SCSI-2 unit, also with 1M of buffer memory. This drive is actually a Teac CD-R55S, identical to that in the Teac kit reviewed here. It performed a little slower than other drives overall, but not enough to really be of concern.

This kit came with the most bundled



software: the ubiquitous Adaptec Easy CD Creator (Standard edition), plus CDR Disk Jockey for creating Audio CDs, Macromedia Backstage Designer Plus, MediaPath MediaAgent, and ECI Disc Inspector Pro, which provides some very basic testing of your discs. Also included is the Smart and Friendly CD labelling kit. On the hardware side, purchasers receive an Adaptec SCSI-2 adapter and the necessary cabling, plus one Verbatim Datalife Plus CD-R disc.

Smart and Friendly kits generally offer a good-value bundle, and this is no exception. The drive is a fast, reliable CD-ROM and it performs well in the CD-R stakes.

- **Distributor** Verbatim
- **Phone** 1800 645 270
- **Online** <http://www.verbatim.com.au>
- **Price** \$949
- **In short** The most comprehensive kit of all the drives we tested, accompanied by plenty of software, a Teac drive and a SCSI adapter. It was also one of the best performers in the Ziff-Davis WinBench 98 CD-ROM benchmarks.

## Teac CDR55Si

### TEAC

The Teac is also a 12x read and 4x write, internal SCSI-2 drive. It comes with 1M of buffer memory and is bundled with an Adaptec SCSI host adapter, and Easy CD Creator Pro software, plus the necessary cables to connect it all up.



## How we tested

APC Labs staff ran CD-ROM read-performance tests on the CD-R drives using the Ziff-Davis WinBench 98 CD-ROM WinMark. This test suite measures the CD-ROM transfer speed capabilities of CD-R drives. The overall score is a comparative indication of how fast the drive can operate when using standard CDs. The CD-ROM average access time is measured in milliseconds (ms) and measures how long the CD-R drive takes to access data on a CD.

The Transfer Rate score shows how fast the CD-R drive can move data when reading a standard CD-ROM. The CPU Utilization result shows how much of the system's CPU time the CD-R drive demanded when running this test. All of the tests were run three times and the results averaged.

We ran four write performance tests on the CD-R drives. We accomplished this by writing data and then audio formats onto standard, generic, blank CD-Recordable media. We then timed how long it took to complete the operation. We used Adaptec EasyCD Creator Version 3.1 as our writing software, and Adaptec EasyCD Copier Deluxe for the CD-to-CD copy tests.

The first test we ran was based on a large data archive residing on the hard disk. We used a hard disk image of the July issue of *apcmag.cd* as our image (644M in size). We then wrote it onto a CD-R at the drive's maximum writing speed and timed the result. The second test was similar, in that we zipped the complete

*apcmag.cd* into a single 612M zip file and used it as a single large image file.

In the third test we used the CD Copier software to copy the July *apcmag.cd* from our Toshiba 8x CD-ROM drive to the CD-R, and timed the result. The last test was conducted in the same way, but we copied an audio CD with 72 minutes and 39 seconds of music.

## Benchmark information

All of the CD-R kits were installed, tested and reviewed on a system comprising the following: Microsoft Windows 95B, Digital Celebris GL 6200, Intel Pentium Pro 200MHz, 64M of RAM and a 256K cache.

Disk subsystem: 2G hard disk, Fast SCSI-2 controller, Toshiba XM-5702B CD-ROM drive, FAT32 file system, and default Windows hard-disk cache.

Graphics subsystem: Matrox Millennium card, 2M of WRAM (Windows RAM), MGAPDX64.DRV 4.10.01.3800, 1,024 by 768 pixels with 256 colours, and a refresh rate of 60Hz.

All of the CD-R drives used Windows default software caching. All products tested were shipping versions available to the general public. These tests were performed without independent verification by Ziff-Davis and Ziff-Davis makes no representation or warranties as to the results. WinBench is a registered trademark of the Ziff-Davis Publishing Company.

Jackson Chan and  
Lachlan Botticchio





INTRODUCING THE TECO ADVENTURER II

# Breaking the time barrier

## 266mhz awesome power plus big picture 13.3" screen



For Power  
Without The Price  
Nothing Else Even  
Comes Close!

## Bundled with Lotus Smart Suite '97

Discover the awesome Pentium power of 233 and 266mhz. New Teco Adventurer II breaks the time barrier in notebook technology - delivering up to five hours or 66% longer battery life\*. Loaded with all the features and reliability you expect, including built-in CD, floppy drive, and MMX technology, Adventurer equips you with everything you need to handle today's demanding working environment, at a very affordable price tag. For power without the price, nothing else even comes close!

\*using power management and Tillamook CPU.



**TECO**

CALL TODAY  
(dealer enquiries welcome)

NSW: (02) 9765 8180  
VIC: (03) 9720 4411

QLD: (07) 3274 5233  
WA: (08) 9479 4355



# subscribe TO APC

## APC Magazine . . .

is Australia's best read publication for computer professionals. APC's independent, authoritative editorial provides the ideal resource for all those interested in technology and where it is heading.

APC's "3-in-1 magazine" concept of paper + CD + Web site has been designed from the ground up to work together. All writers consider how they can structure their articles to make use of the "tripartite" elements of the magazine and how to extend their articles from print-only so that you can make maximum use of the multimedia available. This allows you to read about the topics that interest you in the magazine, then use the CD

to try them out, and the Web site to interact with the magazine's writers, and other readers.

We've also invested heavily in world-class product testing laboratories, APC Labs, to provide the independent, high quality product reviews relied on by Australia's computer professionals.

APC is a 100% Australian magazine, because we know you demand local perspective and analysis on the global phenomenon of technology. APC explains how technology can be used for the maximum benefit, so that we can recommend the products you should use to build your business, and what products and services you should buy.

**Subscribe  
to**

**apcmag**

**today**

and not only will

you save on the

newsstand price,

enjoy the

convenience

of free delivery

but also ensure

that you never

miss an issue of

**Australia's**

**leading**

**computer  
magazine.**



# AND SAVE UP TO **30%**

So **don't miss out** on  
receiving your **reduced  
price** copy every month.  
Subscribe **today!**

**SAVE**

**\$18.40**

1 year subscription  
(12 issues) **ONLY \$65**

(\$5.42 each) saving \$1.53 per issue

**SAVE**

**\$41.80**

2 year subscription  
(24 issues) **ONLY \$125**

(\$5.21 each) saving \$1.74 per issue

JAGUAR DESIGN PTY LTD

Subscribe to Australian  
Personal Computer NOW

**Phone** 1800 252 515  
**Sydney** (02) 9260 0091

## Subscribe on-line to APC!

You can subscribe on-line to  
Australian Personal Computer at  
[www.ninemsn.com.au/subscriptions](http://www.ninemsn.com.au/subscriptions)

**apcmag**



This was the fastest of all the drives in the Ziff-Davis WinBench 98 CD-ROM test, recording data throughput of 913K per second and an average access time of 179ms. But as you will note from the table, this made no difference to the speed of recording a CD-R disc; the Teac drive was pretty much on a par with other 4x write drives.

Although its floppy drives are found in every other computer, Teac is not that well known for CD-R drives. However, this drive should establish the company in that field. It is a good CD-ROM performer and our tests show it performed well as a CD-R unit. It is a comprehensive bundle for those wanting to get into CD-R, and is also available as an external unit.

- **Distributor** Teac Australia
- **Phone** (03) 9644 2442
- **Online** <http://www.teac.com>
- **Price** \$1,120
- **In short** The best CD-ROM performer overall

and a good CD-R bundle for first-timers, although a little more expensive than the other products.

## Traxdata CDR4120 ELPRO

### TRAXDATA

Traxdata puts together many different bundles of CD-R drives to suit all tastes. This kit comes with a 12x read and 4x write



SCSI-2 Traxdata drive. It has a 1M buffer and comes bundled with CeQuadrat's WinOnCD 3.5 and Packet CD, plus cables, a marker pen and two blank discs. There is no SCSI interface card, however, so you would need to buy this separately.

It's worth noting that this version of WinOnCD comes with compression software to double the amount of data you can write to a CD-R disc, though we didn't try this out in our tests. The Ziff-Davis WinBench 98 CD-ROM benchmarks showed this product to be a solid performer, placing in the middle of the pack.

- **Distributor** Traxdata
- **Phone** (03) 9870 5955
- **Online** <http://www.traxdata.com/>
- **Price** \$899
- **In short** A good, easy-to-use drive with reliable software at a reasonable price, although you will need to pay extra for a SCSI adapter.

## Specifications: CD-Recordable drives

Product	Kodak Digital Science 2801IDE	Panasonic PW-7502	Plextor PXR412Ci	Teac CDR55Si	Traxdata CDR4120 ELPRO	Smart and Friendly CD SpeedWriter
Distributor	Kodak	General Micro Peripherals	SCSI Corp	Teac	Traxdata	Verbatim
Phone	(03) 9353 2037	(02) 9540 5000	(02) 9894 6033	(03) 9644 2442	(03) 9870 5955	1800 645 270
Price	\$625	\$599	\$856	\$1,120	\$899	\$949
Online	<a href="http://www.kodak.com/">http://www.kodak.com/</a>	<a href="http://www.gmp.com.au/">http://www.gmp.com.au/</a>	<a href="http://www.scsi.com.au/">http://www.scsi.com.au/</a>	<a href="http://www.teac.com.au">http://www.teac.com.au</a>	<a href="http://www.traxdata.com/">http://www.traxdata.com/</a>	<a href="http://www.verbatim.com.au/">http://www.verbatim.com.au/</a>

### Specifications

Primary drive type (internal/external)	Internal	Internal	Internal	Internal	Internal	Internal
Drive interface	EIDE	SCSI-2	SCSI-2	SCSI-2	SCSI-2	SCSI-2
Maximum rotational speed (read/write)	8x/2x	8x/4x	12x/4x	12x/4x	12x/4x	12x/4x
Buffer size	512K	1M	2M	1M	1M	1M
Disc loading	Power tray	Power tray	Autoload caddy	Power tray	Motorised tray	Power tray
Multi-session capable (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes
Packet-write capable	Yes	Yes	Yes	Yes	Yes	Yes
Software included	CeQuadrat WinOnCD To Go, PacketCD	None	CeQuadrat WinOnCD, Plextor Manager 96	Adaptec Easy CD Pro, DirectCD	CeQuadrat WinOnCD with double data storage compression software, PacketCD	Adaptec Easy CD Creator Standard, Smart and Friendly CDR Disk Jockey and other titles
Other	Audio cable, IDE connector cable	None	CD caddy, audio cable	Adapter AVA-2904 SCSI host adapter, SCSI cable, audio cable	SCSI cable, power split cable, CD marker pen	SCSI-2 host adapter, SCSI cable, custom CD label system
Media/disc included	2 x Kodak Type S CD-R	None	10 x blank CD-Rs	2 x Teac CD-R G74 Gold	2 x Traxdata Gold CD-R	1 x Verbatim DataLife Plus
Warranty (RTB: return to base)	1 year RTB parts and labour	1 year RTB parts and labour	1 year RTB parts and labour	1 year RTB parts and labour	1 year RTB parts and labour	1 year RTB parts and labour

### Benchmarks

CD-ROM WinMark 98 (K/sec)	597	697.33	771.67	913.33	898.67	911.67
CD-ROM Playback (K/sec)	597	697.33	771.67	913.33	898.67	911.67
CD-ROM/Transfer Rate (Inside/Outside) (K/sec)	1,220/1,230	1,230/1,230	1,230/1,840	1,840/1,840	1,840/1,847	1,840/1,840
CD-ROM/Access Time (ms)	215.67	184.67	203	179	188.33	178.67
CD-ROM/CPU Utilization (%)	57.77	3.57	3.51	5.21	5.37	5.51

### Recording tests (hrs:min:sec)

Test 1: Write Data-CD from HD to CD	0:40:03	0:20:56	0:21:09	0:21:08	0:21:08	0:21:07
Test 2: Write Data-CD from HD to CD	0:37:30	0:19:23	0:18:59	0:18:48	0:18:50	0:18:51
Test 3: Copy Data-CD from CD to CD (*See Note 1)	0:39:18	0:20:09	0:19:55	0:19:45	0:19:45	0:19:49
Test 4: Copy Audio-CD from CD to CD	1:56:23	1:37:52	1:39:47	1:37:01	1:38:40	1:36:57

#### Notes

- The source is not copied to hard disk drive before recording.
- All products used in these tests are shipping versions available to the public at the time of publication unless otherwise stated.
- The above specifications refer to the actual products tested by APC Labs. Check with the vendor for the latest versions.
- Winstone, WinBench and associated programs are registered trademarks of the Ziff-Davis Publishing Company.
- These tests were performed without independent verification by Ziff-Davis, and Ziff-Davis makes no representations as to the results.



Style

Space

Sound



Total performance.  
SyncMaster TFT LCD monitors.  
Call 1300 369 660.

**SAMSUNG**

ELECTRONICS





# MAG *nificent*

**“JAG” control is the revolutionary new rotary control with the circular patterned OSD menus.**

Now, your screen can be adjusted to perfection with just a simple touch by using a single turnable knob with push button. You are able to easily control all the geometric settings (contrast, brightness, size, position, pincushion, rotation, trapezoid, parallelogram, degaussing, zoom, factory recall, and user mode) in an ergonomically correct position.

MAG monitors are dedicated to quality and customer service. We implement 100% Incoming Quality Control Policy using our own tightend specifications.

Not only do we thrive on quality and service, but also on innovation and technology. Today, all MAG monitors are conformed to the latest TCO standard. We provide two-year full warranty for all MAG monitors to give better service on top of highest quality products we supply.



## MAGTRON



EXCLUSIVE AUSTRALIAN & NZ DISTRIBUTORS

**Magtron Monitors  
(Australia) Pty Ltd**

Unit B2 1-3 Rodborough Road  
Frenchs Forest, NSW 2086  
Ph (02) 9975 3727 Fax (02) 9975 4872  
Internet: <http://www.magtron.com.au>



NSW: CX COMPUTING (02) 9233 6288  
GLOBAL BUSINESS TECHNOLOGY (02) 9644 3900  
GLENEAGLES COMPUTER (02) 9212 5888  
SYNAX SYSTEM (02) 9905 5977  
MICRO PRO-MANLY (02) 9977 6111  
VIC: UTC INTERNATIONAL (03) 9809 6644  
QLD: ABLE SYSTEMS (07) 3257 1772

SA: PC COMPUTERS (08) 8332 6513  
OMINIL OGIC (08) 8244 4211  
TAS: TOPSRAM (0362) 348 144  
YAMAKHOSI (0362) 270 414  
NZ: DORNWELL TECH. (649) 624 3200  
PNG: HIGH TECH (675) 325 7477

1996-3



Desktop video production is moving in on 'professional' broadcasting. **By Jason Gregg**

## Who's in charge around here, anyway?

Occurring like a small pebble in the sands of the hourglass that chronicles the passage of the computer revolution, the emergence of desktop video production went largely unnoticed by the guilds. As happened in the publishing industry, the keepers of the craft of all things television largely dismissed the evolutionary charge of 'non-professional' equipment, dismissing it all as 'toys'. Not any more!

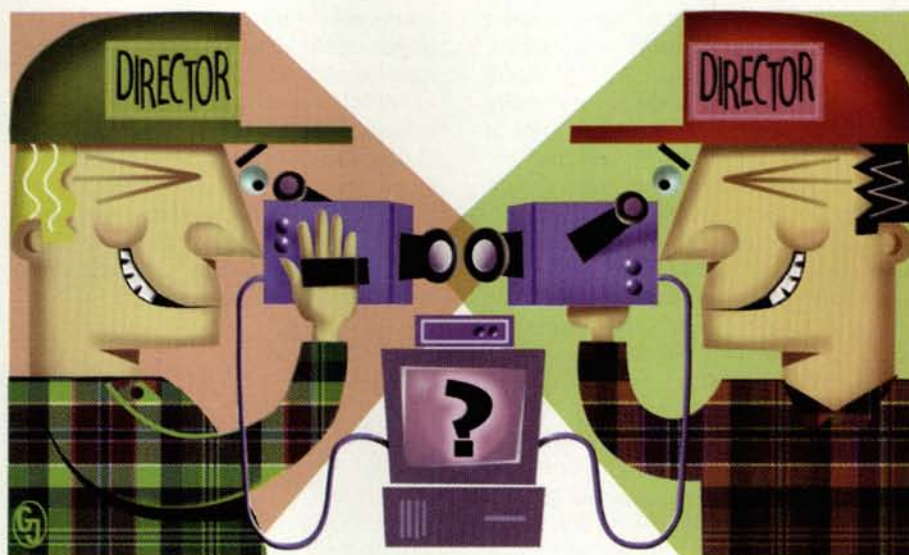
Creeping up on the industry from an unexpected direction, these 'consumer toys' have recently metamorphosed into powerful, high-resolution and near-broadcast-quality production tools, and they are underpinning a public communications revolution. Japanese engineering genius has spawned a range of camcorders that offer extraordinary picture quality, and which today challenge the output of some studio equipment.

Software developers have found ways to get around the inflexibility and limited facility of tape-to-tape editing systems by transposing the video tape paradigm to the desktop. Broadcast standard is being blurred by a criterion known as 'broadcast acceptable' and some news directors are issuing digital palmcoders to journalists. What's more, the captured vision is going to air, unfiltered, unsanitised. And it appears the viewing public can't tell the difference.

What exciting, interesting times when anyone with the desire, relatively meagre capital and a modicum of talent can actually realise the dream of being a television or video producer. Well, sort of...

As with any endeavour that involves loading the airwaves with an electronic signal, there are standards to be met. These rules define the recording and storage protocols of video and audio signals, as well as the amplitude, bandwidth (or electronic address) and content of this signal when it is to be broadcast.

There are the rule makers (led, more or less, by the Federal Government) and the rule keepers (a number of industry bodies,



broadcasters, manufacturers and other interest groups). Both have a role to play in determining the standards that must be adhered to when producing compatible and accessible video productions.

One such group is the Society of Motion Picture and Television Engineers (SMPTE) — you'll see these initials a lot if you get into serious video production. The timeline that runs along the top of most desktop editing packages is the SMPTE timing system, a recognised standard of addressing the duration of a video project. SMPTE membership is open to non-professionals, but it is predominantly a constituency of broadcast and motion picture professionals such as engineers and film-makers. The organisation is also the convener of a hallmark technology conference that bears its name.

### The TV landscape

In order to work, TV receivers require a source of field timing reference signals. These are signals that tell the TV receiver to be ready to receive the next picture in the stream of images. Early set designers decided to use the mains power supply frequency as this source for two good reasons.

The first was that with the older types of power supply, you would get rolling hum bars on the TV picture if the mains supply and power source were not at exactly the same frequency. The second was that TV studios would have had enormous problems with flicker on their cameras when making programs without a consistent source of timing.

There are two mains power frequencies widely used around the world: 50 and 60Hz. This has divided the world's TV systems into two distinct camps, the 25-frames-per-second camp (50Hz) and the 30-frames-per-second camp (60Hz). The 60Hz followers made a further small adjustment, changing the field rate to 59.95Hz when they added colour to the signals.

The first colour broadcast standard was implemented in the US in 1953. It was based upon the National Television System Committee or NTSC (lovingly known in the industry as 'never twice the same colour') standard. It has been implemented by many countries including Japan, most South American nations and both North and South Korea.



NTSC runs at 525 lines per frame and 30 frames per second. Videos made to the US standard will not be able to be displayed on non-NTSC-compatible sets or playable on equipment that is not NTSC compliant.

Australia adopted the PAL or Phase Alternating Line system (to some 'picture at last' or 'people always lavender'). It was introduced and implemented in most European countries (except for France) in the early 1960s. PAL runs on 625 lines per frame and at 25 frames per second. Using wider bandwidth and a greater number of lines, PAL offers better picture quality than NTSC.

France, Bulgaria and a couple of other countries chose yet another standard, SECAM (Sequential Couler Avec Memoire — referred to by some as 'system essentially contrary to America'). Like PAL it runs at 625 lines per frame, but it transmits the colour signal sequentially, rendering it incompatible with the PAL standard.

In general, since the field and scan rates are identical, you can expect to get a monochrome picture from a PAL video recording replayed on SECAM equipment, and vice versa. Transmission frequencies and encoding differences make equipment incompatible from a broadcast viewpoint.

In Europe, a few direct satellite broadcasting services use a system called D-MAC. Its use is not widespread at present and it is transcoded to PAL or SECAM to permit video recording of its signals. It includes features for wide screen aspect ratio transmission and an eventual migration path to Europe's proposed HDTV standard. There are other MAC-based standards in use around the world, including B-MAC in Australia and B-MAC60 on some private networks in the US.

### Where computers fit in

Television and video tape are not the only ways to display video works. CDs, DVDs and the Web all offer legitimate display and distribution alternatives to magnetic tape and broadcast transmission. Again, rules apply to standardise these formats and thus create compatibility so that works can be exchanged.

It was the Joint Photographic Experts Group (JPEG) that created a standard for bit-rate reduction so still pictures could be compressed, but it was found inadequate for moving pictures. Enter the Moving Pictures Expert Group (MPEG), which devised a separate coding scheme for transmitting moving pictures and recording them on standard digital storage media such as CDs. It dictates the standards for the computer-based pictures, while SMPTE controls the video standards.

A meeting between the International Standards Organization (ISO) and International Electrotechnical Commission (IEC) in 1992 resulted in a standard being adopted for audio and video encoding known as MPEG (ISO/IEC 1172).

MPEG-2 (ISO/IEC 13818) became a recognised standard in November 1994, the main differences from the basic version being optionally lower sample rates (less storage requirements) and something called psycho-acoustic sampling, which attempts to make sound pleasing to the ear while still allowing it to reside in the digital compression and recording environment. In execution, MPEG-2 delivers picture and sound quality that rival studio standards.

MPEG-2 does not support interlaced video (as used in your television set) and is designed to address the needs of computer-based handling of video or moving pictures. What it does do is define the syntax of various parameters of the video stream such as bit rates, picture sizes and resolutions that can be applied.

## Get ready to blow your mind as this natural marriage of video and computers fosters new and exciting advances in products.

Standards such as MPEG-2 also provide manufacturers with the scope to develop compatible hardware that will vastly improve the encoding of the video and audio signal. A perfect example of MPEG-2 aiding and abetting advances in improved moving pictures is the use of this encoding protocol in DVD technology. Full-length motion pictures, complete with surround sound, are available today on a single-layer DVD no bigger than a standard CD.

Thanks to MPEG-2, all it takes is a click on the DVD player application on your notebook computer, and a two-hour Bruce Willis action adventure is screened. (For a taste of the power of MPEG, check out the awesome reel of Lightwave samples on this month's cover CD — all composed on desktop PCs by Melbourne agency, Planet X.)

It's no surprise that since digital video (DV) technology was introduced in late 1995, it has fostered a closer alliance between computers and video recording devices that resulted in pushing the horizons of small studio production far beyond the capabilities of consumer analog formats.

Fortunately, the defining format of DV is settled, agreed upon by all of the major manufacturers. While subtle differences

do exist (Sony has its DVCAM and Panasonic has DVPRO), these remain refinements rather than diversions from the agreed format.

Digital video uses a standard technology called DCT (Discrete Cosine Transform) to record the video image onto metal tape. DV differs from other formats in several ways: it has a compression standard of 5:1, a line resolution that exceeds the nominal 400 limit of other formats such as Hi8 and S/VHS; and a new 6mm tape size.

There are other differences too that distinguish DV from conventional analog technology. DV uses a method of 'sampling' to record analog information. Sine waves that are inherent in the analog world are converted to square waves that are then compressed via in-built CODECS (compression-decompression algorithms) into the natural language of the computer.

This access to digital pathways in what has been, until now, an analog world suggests exciting possibilities in the performance, resolution, picture quality and size

reduction of components. It also offers greater accessibility by non-professionals to powerful, low-cost recording and production technology. The age of 'people's television' is nigh.

So where do we go from here? To say that the future of video production lies in further advances in DV would come as no bolt out of the blue. Expect increased picture quality from better detectors and smarter CODECS, and look for further miniaturisation of componentry from LSI (large scale integration) techniques.

You can anticipate price reductions as the market buys into the format and you'll see easier editing from better software and hardware solutions on the desktop. There'll be more market opportunities too as the industry adopts this format.

Above all, get ready to blow your mind as this natural marriage of video and computers fosters new and exciting advances in products — enablers that will assault our senses, challenge our creativity and further blur our already clouded vision of what will be the future of visual communications.

For a discussion on how to set up your video production studio, see 'Just DIY' on the opposite page.



Setting out on a video-making venture, starting with just a camcorder and a computer. **By Jason Gregg**

## So, you wanna be in pictures?

**Y**es, believe it or not, you are not alone if you're currently considering launching into a career as a pocket media mogul. In fact, the current groundswell of interest in desktop video production is gathering so much momentum, it's reminiscent of the explosive growth of desktop publishing in the 1980s.

And just like it was back in the DTP era, the horizon for budding Spielbergs is clouded with hype, misinformation and promise. Listen to the buzz and you could believe that just about anyone today can build a successful business in television movie making, armed only with a meagre budget, a PC and a camcorder.

Oh, if only it were true. Instead, the road to Hollywood or the Logies is more likely to be paved with buyer remorse, blown budgets and lots and lots of wasted hours, with nothing to show but heaps of bad videos.

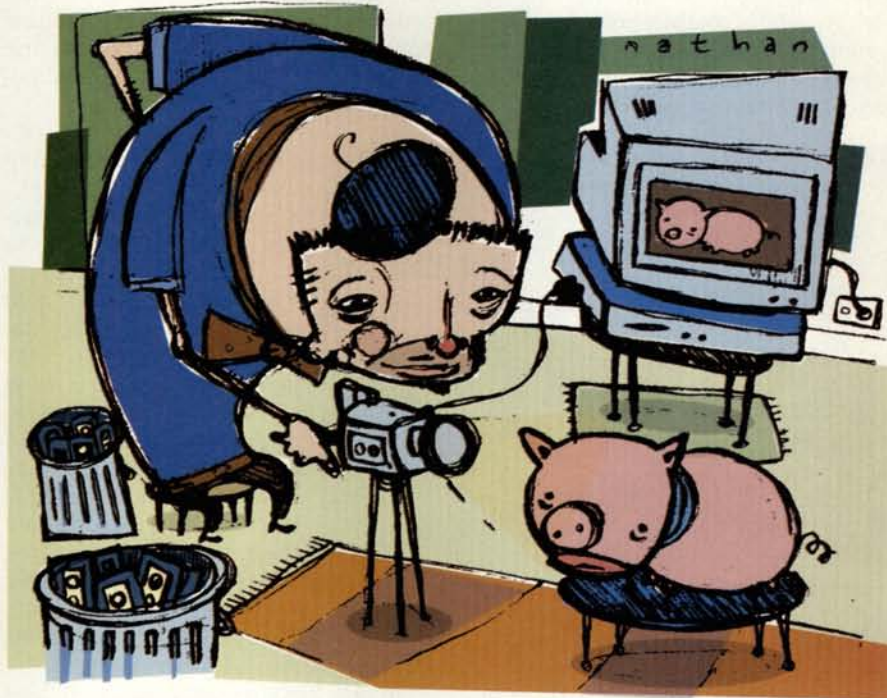
Just like in the early days of DTP, buyers are spending big on equipment to enter markets about which they have little understanding and for which they have even less talent and aptitude. But then, that never stopped quite a few hopefuls in the '80s from growing their humble kitchen publishing empires into full-service graphic houses.

All it really takes is enough capital, innate business savvy and the tenacity to survive long enough to learn about what really works, where the money really is, and how you plan to participate in what many believe is the most significant advance in personal expression since the invention of PostScript and the laser printer.

Of course, if you're coming from a commercial television or video production background, this will all be old stuff. For you, it will be largely a matter of changing gears and altering paradigms.

But for the rest of us, armed with little more than a dream and a cheque book, we'll need a roadmap, and a forward scout to survey the land and bring back the facts.

This article is exactly that, at least from



this writer's perspective. By the way, it is not the intention of this article to provide an in-depth critical review of each of the products available, but rather to offer a summary of the category leaders. Admittedly, this approach, dictated by scope and available space, will necessarily include many of my own prejudices and preferences; but hey, I already have shelves of products that were just right at the time and are now gathering dust. If you already use and love a product that I don't name here, don't regard exclusion as disdain on my part towards other products.

In fact, I use many of these hardware and software products every day and while that doesn't qualify me as the adjudicator of 'what's best', I've wasted lots of my money already so you don't have to.

I spend my days actually making video-based products that are sold to real people that have an expectation that they are receiving value for their money. My

products are distributed around the world, they sell well and I've yet to have one customer ask for a refund.

Anyway, enough of the disclaimer already — we need to get on with the shopping.

### Take one

To begin with, a reality check is a good idea — find out whether this is really what you want to do and, more importantly, whether you are willing to spend lots of dollars and time before you can expect to get one cent back.

With the current rate of evolution in desktop technology, much of what you purchase today is already obsolete before you get it home. In desktop video production, the burn rate of technology is nothing short of meteoric. First there was analog, and now digital camcorders are challenging even studio-quality hard-



ware. Something called 'Firewire' already beats the hell out of the analog board that only a month ago was top of the heap and, of course, when it comes to video, there isn't a processor built that renders fast enough.

So, with equipment growing obsolete in a year or less, you have to build in depreciation curves that look like Everest if you are to truly make money in this new venture of yours. With an up-front spend of, say, \$7,000 to \$15,000, you'll be looking to recoup at least \$1,000 a month just to cover your capital investment!

Oh yes, and of course there are the jobs shooting weddings. Are you really willing to spend at least two to five hours at the church and reception — then more time,

on 'Australia's Funniest Home Videos' or if you happen to have captured that once-in-a-lifetime news event.

So, if the salesperson or the back of the box blurb says it's 'broadcast quality', and the price doesn't send you into a spin, *don't believe it.*

In all, if you're considering doing anything other than condensing your video home movies onto VHS so you can bore the pants off your dinner guests, then be ready to spend, spend, spend.

Discouraged? Ready to drop out right now? Well, thanks for being with us.

For the rest of you, the hardy, obstinate ones still left on this flight into the unknown, we'll begin by building a shopping list.

In order to capture, edit and output a reasonably usable product on a PC-based non-linear editing system, you first have to understand the enormous burden that this application places upon small computer technology. Data rates of 6M per second and storage needs of 8G are not uncommon.

Your shopping list for a basic, commercially viable editing workstation should, therefore, begin with the best (read 'fastest') processor you can afford. Avoid 'off brand' BIOSes and chipsets, other-

wise you risk incompatibility with some finicky video hardware devices.

In fact, this is one area where I suggest that 'branded' PCs from the major manufacturers are the go. The DVD and Multimedia badging suggest at least that they have been architecturally optimised for the task.

But if you do prefer to build it yourself or buy a no-brand, then get the biggest chassis you can with a generous number of slots and nothing less than a 300W power supply. Add a second fan — a box type from somewhere like Dick Smith or Tandy will do the job — and you now have the minimum basic PC platform for the purpose.

Add no less than 64M of high-speed RAM (you should be considering NT Workstation as your OS), a 4M video card with direct draw, the usual floppy, CD-ROM drive and back-of-the-box interfaces. By the way, a second CD drive — a writable device — will be almost a necessity, as will an internal 8G tape back-up unit.

And now the fun bits — the cards and thingummies that go to turn this personal computer into the magic video machine.

## Take two

We'll begin with an item that we passed over in the basic configuration, the hard drive storage. You'll need a multiple drive system that includes, say, a 6M IDE drive for applications, and a couple of Ultra Wide SCSI-2 drives — 2G and at least 9G capacity. Besides storing the applications themselves on the IDE drive, it's also a good place to store data associated with general applications like word processing.

The 2G SCSI-2 will be the 'capture' drive — remember that no AVI file can exceed the 2G limit, so keep this drive clean. Defrag it regularly and transfer your captured file to the working drive as soon as possible in order to free up the 2G to accept your next capture.

The largest drive is where 'works in progress' will happen (feel free to blow the bank here on the biggest, fastest, meanest SCSI-2 drive you can afford; when it comes to video editing, there's no such thing as too much storage!). Above all, if you're planning to output to tape, then a 9G Very Fast AV drive is the absolute minimum usable size. If your final job is, say, 4G (about 30 minutes of finished video), then you'll need at least that much again to swap and edit the raw files. And that's with frugal housekeeping protocols in place.

Unless you have more storage than the tax office, you'll need to get rid of unused files, otherwise that monster system will very quickly seem like a dwarf. Be careful, though: the further you get into a job, the more filenames will sound the same, and sooner or later, you'll toss a critical version of a file, wasting hours of hard work. My safety net for this is a clipboard alongside the workstation to record a sort of edit decision list — a line-by-line record of working files.

The next critical item is the bit that allows you to get video into your PC — the capture card.

Right now there are two decisions you'll have to make — whether you'll be working in analog only or if you're going to take the plunge into digital videography. Budget will be a big determining factor here, and will help you decide whether you purchase a digital or analog camcorder.

By the way, a digital camcorder will allow you to work in either analog or digital, but you'll need a digital capture card and special cable (IEEE-1394, more commonly known as a Firewire cable). These will allow you to capture in digital format, avoiding the loss of quality that comes from converting an analog signal to the



say, six hours editing — just to invoice for \$500 or so?

And what about that matter of 'broadcast quality', the single greatest untruth foisted upon the video buyer since 'magazine quality' output was used to puff sales of printers and scanners?

There are real standards that broadcasters subscribe to and use to evaluate acceptable quality (see page 133), and video that has been shot on consumer products, whatever the salesperson said, won't make the grade — full stop.

If your plans include producing something to sell to broadcast stations, you'll need to spend heaps on your setup if you want them to consider your masterpiece for broadcast.

On the other hand, it remains a fact that many stations, particularly in the news departments, are already using small digital camcorders, and the ABC's 'Race Around the World' series proves the startling quality that is available from these palm-sized wonders. But generally speaking, the quality of output from a non-professional camcorder will be accepted only



computer-compatible digital form during the capture phase, and then back again when outputting to tape.

## Lights

This seems like a good time to explain the capture process further to help you understand why quality loss occurs. While it's true that computers think in digital, video is traditionally an analog medium. To get analog data into a PC-readable form, the video is converted on the fly into digital format during the capture stage. Just converting the video image results in the first loss of quality. You then cut and splice the digital rendition of your data, reorder it, add transitions, voice and music, and finally 'render' and compress it in your software editing package. The compression is necessary to take your work back into analog, but results in more loss of quality.

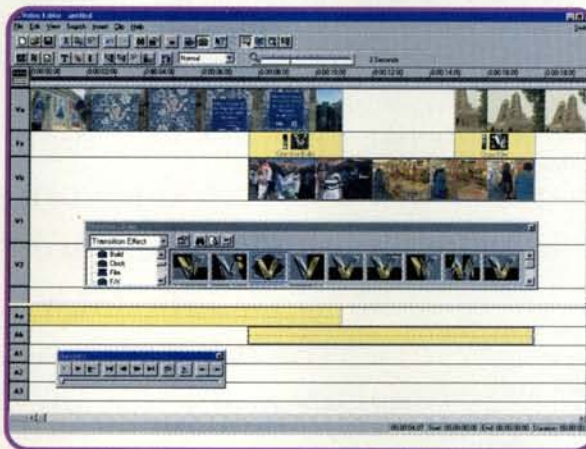
Now you 'print to video tape' — output your finished work to a master tape. Before you can do that, however, the computer needs to convert the project to analog form so the video tape will accept the data. Another conversion and still more loss of quality.

If these quality losses will cause you problems, a digital camcorder and Firewire-equipped digital capture card are the solution. The duplexing IEEE cable allows two-way communications between the camcorder and the PC, thus maintaining the data in digital format throughout the project. Better still, the camcorder can be controlled by the PC and software to select and capture only the clips you need. And it will provide a way to use the camcorder as a line recorder, meaning you can save your project back onto digital tape without loss. Brilliant!

So back to the choice of capture board: if you plan to go analog (and the results are still very marketable for most projects), your choices are simple. Both Pinnacle and DPS market quality products, with Pinnacle's Miro DC30 and DC30 Plus and the DPS EditBAY grabbing the bulk of the market. Both are reliable, excellent-quality products. The DC30 Plus is my preferred choice because its faster throughput and additional features that are not available with the EditBAY make its premium price worthwhile. There are other boards out there, but for most needs and to keep within a realistic budget (nominally \$7,000 to \$10,000) and to provide a performance window that maintains acceptable quality so you can sell what you make, these two boards are, in my mind, the lower limit of the bar.

If you plan to go digital, you have another choice — you could make do with just a digital board and avoid the additional cost of the analog board, but you will be limited to capturing only from digital format tapes. Of course, you can still output to analog via the DV camcorder; but trust me, you will need to work from analog material at some time in the future.

I recommend the miroVIDEO DV300



from Pinnacle Systems and the comparable DPS Spark. Both are quality products, and the DV300 would be my personal choice, in spite of some very dodgy early-version software.

Once you have the basic hardware configured, you need application software to turn what is basically a personal computer into a work-ready, non-linear video editing station.

What the scanner or printer is to desktop publishing, the capture card is to video production: it is used only occasionally, when inputting or outputting your work. The heart and soul of your system is interred in the editing software you select.

This end of the market is by and large dominated by two editing products: Premiere from Adobe and Media Studio from Ulead Systems.

Both provide a way of displaying video files graphically as individual frames and soundtracks. You trim and join clips with a scissor or blade tool. To form a contiguous video, you drag and drop scenes, and swap between them via a bundled library of slick transitions — page turns, dissolves, explosions and wipes that were impossible with conventional linear tape editing.

The basic software function of each is relatively easy to master after following the tutorials, and both products come with comprehensive documentation, although Media Studio wins here with more clarity and explanation.

But while the basic editing metaphor is common to both Premiere and Media Studio, the products are different.

Although I have used both products extensively, I've been tied to Premiere because of several plug-ins that, until now, would work only with the Adobe product. These plug-ins are really sub-applications or attributes that run inside the core application and often appear embedded in the menus of the application itself. In particular, special effects that are not included in the library of the application are available as plug-ins, expanding the capability of the editing software.

The problem has been that many of these more popular plug-ins were developed with Premiere 4.2 in mind and have only now been enabled for Media Studio.

The newer version of Premiere is not compatible with many of these plug-ins, and

Pinnacle is still to release (at the time of writing) updated drivers for its products for Premiere 5; so I suspect that, like me, some users are opting to stay with 4.2 for the time being.

Still, Premiere has come a long way since the first clumsy product that was the vanguard of desktop video editing. More hardware capability has invited more innovation in function, and the latest Premiere release — Version 5 — offers real potential for professional-level editing and production.

Media Studio differs from Premiere mostly because of its bundled additions, which greatly expand the capabilities of this package beyond the Adobe product. Not only do you get a video editing and capture package, but also Video Paint, a program that provides for animation and rotoscoping, or retouching of individual video frames; and CG Infinity for creating splashy titles and animation effects.

Depending on what capture board you purchase, you will probably get a bundled version of either Premier or Media Studio, and as each is excellent in its own way, there is little need to change. I do recommend, however, that if you receive only a 'light' version of editing software in the bundle, pay the extra to upgrade.

Similar to editing video, you trim and fade soundtracks, and control their volume with tools. Although the sound capture tools are adequate in both packages,



my own choice would be to add a stand-alone sound editing package such as the superb Sound Forge from Sonic Foundry if you want to do more than just capture and include a soundtrack. Inexpensive in the scheme of things, with practice the Foundry will turn you into a real sound gourmet. And remember, while lousy video can be passed off as 'artistic', bad sound is just downright annoying.

In all, the process of editing is not difficult to master, but bear in mind that no software developer has yet worked out how to bundle good judgement and design skills in the one box.

In fact, the biggest problem that faces the neophyte is exercising a modicum of restraint, lest your video turn into a monument to artistic bad taste.

## Camera

And now the question of performance. Unlike the more powerful dedicated editing systems like the Media 100 and Avid, our PC system will require that we render our final work before we output it to video tape. Video editing on the desktop can be fun, inviting you to experiment and plumb the depths of your creativity. It can also be a great waste of time. Even the simplest job can turn into an unproductive loss of operator hours while the processor chugs away, rendering your work. Transitions, special effects and virtually anything you do that alters the raw footage will need to be processed before it can be included in the final video movie. This means heaps of processor lockout, or time lost on your workstation because the rendering step is so processor-intensive, and multitasking is simply out of the question.

Unless you want to spend countless frustrating hours watching a progress bar inch slowly along, many times only to freeze and bring down the whole system, you'll need to do a few things to optimise your workstation. First, adopt an attitude that, like the rule about 'no storage is too much', there is no processor too fast for video editing on the PC.

Be prepared to keep up with advances in processor performance and be willing to upgrade with significant speed increases. Faster rendering means faster, more efficient output and less downtime on your workstation. Hours of lost time can soon add up to a good case for an upgrade. And be generous with RAM — it's cheap in the scheme of things.

Second and perhaps more important, keep your system squeaky clean. Video editing really pushes the envelope of per-

sonal computers and places a constant environmental management demand on the user. Avoid leaving 'trash' in your Windows registry and make sure your hard drives are error free and defragged regularly. Avoid like the plague doubtful products that 'optimise' or manage your system. Get rid of gadgets like system monitors and swish screensavers and backgrounds — all they do is cheat you of optimum output. Even virus checkers that run in the background can have a negative impact on performance.

If you plan to use your PC for other things like word processing, graphics retouching or email, shut down all other

## Watch the work of the masters, the truly great film-makers, and you will learn the difference between what's good and what isn't.

applications when editing. Turn off screensavers, avoid the interruptions of network polling and free all the resources you can for the editing task.

Windows NT is the more robust, stable platform for this application, but if you need to stick with 95 or 98, then good housekeeping should avoid many problems.

## Action

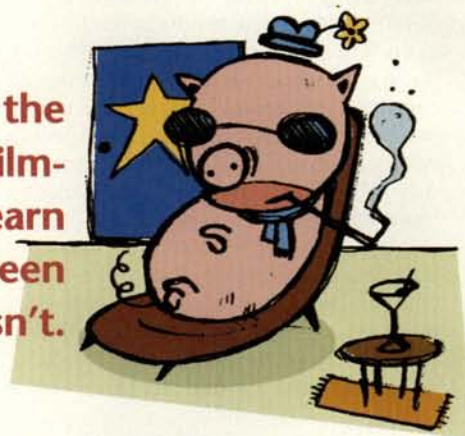
Well, your shopping list is complete. All you need now is to develop the skills necessary to produce marketable video productions. Realise that a cheque book alone is not enough to make a business in video production. Watch the work of the masters, the truly great film-makers, and you will learn the difference between what's good and what isn't. Few of us are born with the instinct and it can be learned.

Read and study; take courses on camera operation; learn how to frame shots, light scenes and capture proper sound. Discover how to work with models and actors and look beyond weddings; there are opportunities for small production groups that can deliver cost-efficient and professionally produced training tapes and corporate videos.

Consider producing your own video product too. Can't think of a subject? As anyone in publishing will tell you, 'how-to' titles are hot. Locate the expert in a field and put them on video. Opportunities

abound in special interest groups; I know of one small US producer who is still making money five years after he approached the pot-bellied pig breeders association and produced a how-to video. The association even gave him access to its mailing list for his direct marketing mail-out.

Around this time 10 years ago, I was dripping makeup, sweating under the lights of a set at the CNN Studios in Atlanta, about to roll production of another episode of 'Computer Solutions', a weekly half-hour television show about



small computers. It went out across the US, Canada and to the Armed Forces in Germany. As the producer and on-camera host, I'd nurtured this baby to grow a weekly audience of more than 26 million as I learned the ropes of making a very successful broadcast television show.

Recently, in a fit of nostalgia, I pulled out the old tapes and was immediately struck by the sheer lack of production values that were apparent. Indeed, I could create a far better product today that was more marketable, more entertaining and far less costly than this decade-old time bite. More importantly, I could produce 'Computer Solutions' as an independent using today's desktop equipment and digital camcorders, and beat the hell out of what we did back in Turner's studios using the so-called state-of-the-art tools of the late '80s. This is day one of the revolution, the beginning of people's television, a time when anyone can be a mogul, no matter how small-time.

If you decide to join the revolution, though, remember what Earnest Hemingway answered when asked, 'What is the key to becoming a great writer?'. His advice could be repeated, with emphasis, to the budding video producer: 'Develop an inbuilt, fail-safe shit detector!'. What we don't need is more bad television, wouldn't you agree? ■



# Workshop

139 APC Magazine

CONTENTS

**W**elcome to Workshop, the section dedicated to bringing you all manner of tips, interesting information and do-it-yourself tutorials. Within these pages you will find useful shareware, informative operating-system-specific columns and easy-to-follow programming tutorials.

Big changes are under way for Workshop in the near future, with the introduction of an NT column, new programming columns and an interesting little newsbytes addition. These won't be appearing until the end of the year, so if you have any ideas about what type of columns you'd like to see in Workshop, you can drop me a line on [amills@acp.com.au](mailto:amills@acp.com.au).

Also, if you're going to be upgrading to Windows 98, or have done so already, don't forget to check out the *Windows 98 Pocketbook* which is on sale in newsagencies now.

It has been written by your favourite Workshop writers and is filled with all the wisdom you need to make the most out of Microsoft's latest operating system.

## Tech Talk 140

Tech Talk deciphers the background behind DVD, while Step by Step gives the lowdown on search engines.

## Operating Systems 146

Windows 95 shows you how to replace Explorer with a better shell; OS/2 reveals the mysteries of the command line; Mac OS explains how to make the most of Microsoft Office 97; and Linux takes a look at RPM, the Red Hat Package Manager.

## Programming 154

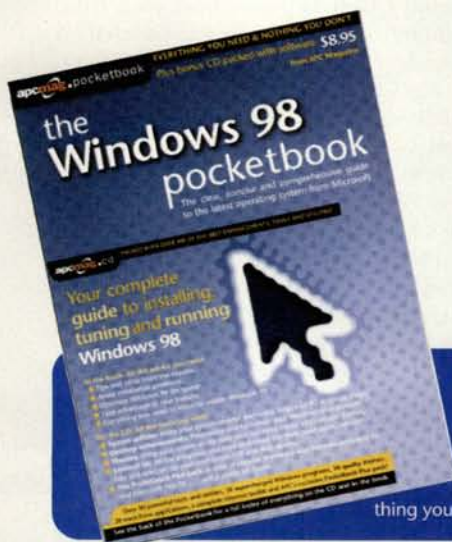
Developers Corner begins a two-part series on pointers, JavaScript takes a philosophical look at the language, and HyperText ponders the importance of machine-generated code.

## Shareware Summary 160

All the files mentioned here can be found on this month's **apcmag.cd** in the Workshop section.

### The Windows 98 Pocketbook

Thinking of upgrading? Don't want to wade through volumes of expensive books looking for the right guide? Look no further! The *Windows 98 Pocketbook* has everything you need and nothing you don't. **On sale NOW!**



### Win! Win! Win!

Workshop is on the lookout for the most interesting, strange, funny, or downright weird software bugs you can find. These include code snippets, examples of features that function poorly, or procedures for crashing a particular application. Anything and everything that is buggy deserves mention.

Send us the bug of your choice via email to [bugs@acp.com.au](mailto:bugs@acp.com.au) or snail mail, and you'll be in the running to win your choice of **development or application software** prizes from Workshop's limited software collection. The prizes change each month to ensure there's always something interesting for avid bug-hunters. Feel free to send screen captures or example code listings, as well as details of how to duplicate the bug, if applicable.

This month's winners will be announced in the November edition of APC, and the winning bug will appear in the Bug of the Month column. So start hunting!



### Bug of the Month

This month's bug comes from Simon Parker. Simon is using bitfields to represent Boolean values in his C program. Trouble is, when this program is run the output is 'The world is crazy!' We assign TRUE to thing.b1, but immediately afterwards thing.b1 fails a comparison with TRUE. *Why is it so?*

```
#include <stdio.h>
#define TRUE 1
#define FALSE 0

int main(void)
{
    struct {
        int b1 : 1;
        int b2 : 1;
    } thing;
    thing.b1 = TRUE;
    if (thing.b1!=TRUE)
        puts( "The world is crazy!" );
    return 0;
}
```

The answer lies in the way most modern systems represent signed integers. If the most significant bit of an integer is set, the integer is considered to be negative. When the integer is 1 bit wide, like thing.b1, any non-zero value will be assumed negative. For the comparison the bitfield is converted back to a signed integer and we compare negative one with one. No big surprise that the comparison fails.

The workaround? You could use unsigned ints for the struct thing. A better solution is to use the C/C++ compiler's inbuilt logic handling.

Instead of: `if (thing.b1!=TRUE)`  
simply use: `if (!thing.b1)`

### Get involved

All files mentioned in Workshop can be found on **apcmag.cd** or downloaded from our Web site at <http://www.apcmag.com>.

You can email us at [workshop@acp.com.au](mailto:workshop@acp.com.au), or send snail mail to APC Workshop, PO Box 37, Sydney NSW 1028.  
**Ashton Mills, Workshop editor**



*The natural evolution to DVD has not been a smooth transition.* **By Nathan Taylor**

## Technobabble

**D**VD, the logical successor to CD technology, has been in the works for several years now. In that time, several disputes have been resolved, standards have splintered and the very meaning of the acronym has changed. At the moment, exactly what DVD stands for has been mooted, and the term is just DVD. It has been known previously as Digital Video Disc (because it does for video what CD did for music) and Digital Versatile Disc (because, like CD, it has many applications).

Without any compelling reason to upgrade, many users have shied away from DVD until now. Foundries for producing DVD titles are few, particularly in Australia. As a result, both DVD movies and software titles have been thin on the ground, so why would you fork out all that extra money to upgrade?

At the moment, it's essentially a case of software providers saying they won't produce DVD titles until sufficient hardware exists in the market to economically support software production, while hardware manufacturers cannot sell any devices until the software is there to compel the market to upgrade from CD-ROM.

DVD-ROM remains an important technology, despite the 'chicken-and-egg' situation that hardware manufacturers and content providers have created. At the time of writing this article, less than a dozen DVD movies had been released in Australia, and hardware penetration would account for only a few percent of home PCs. As far as we know, no DVD computer software titles have been released in Australia.

This is all set to change in the next few years, however. By the time you read this, many more movies should be available, with the major movie studios and distributors, including Time Warner, Columbia Tristar and Village Roadshow, all releasing a growing number of titles into the Australian market. The first software DVD packages should trickle into circulation as well. The era of DVD is not yet

upon us yet, but all projections indicate it soon will be.

### The technology

DVD technology is clearly an evolution of CD technology. It uses the same 'pits and land' encoding method of CD-ROM (see last month's Technobabble), except in much finer detail. The space between one spiral of the track and the next — the track pitch — has been reduced to 0.74 microns, whereas in CD-ROMs it is 1.6 microns. In addition, the wavelength of the laser used to read from the disc has been reduced from 780 nanometres to between 635 and 650 nanometres. This enables pits to be as small as 0.4 microns across; CDs have holes that are 0.834 microns.

As a whole, these features improve a disc's maximum capacity from 682M in CD-ROMs, to 4.7G in DVD — a sevenfold capacity jump. But DVDs have several other features that can increase a single disc's capacity even more.

The first of these is the dual-layering feature. On a single side of the disc, a DVD can have two data storage layers. The reflective coating underneath the top layer is only semi-reflective, and the laser can read through it to the bottom layer by refocusing. This does not quite double the capacity of the DVD; the lower reflectivity of the upper layer limits it to only about 3.8G of storage, but using it yields a maximum of 8.5G for a single side of a DVD. Unfortunately, production problems with dual-layer discs are still plaguing the industry, and it may be some time before we see dual-layer technology widely implemented.

Finally, DVDs can be double-sided, even dual-layered and double-sided, allowing for a maximum capacity of 17G on a single disc. There are some problems with double-sided discs, however. For one, they will require flipping, so you may have to turn the DVD over in the middle of a movie. Additionally, labels can only be printed holographically, and double-sided

DVDs are also more subject to physical damage because neither side of the disc is protected and the substrates are much thinner.

DVDs have exactly the same form factor as CDs, and all available DVD drives are actually capable of reading CDs, although some of the first DVD drives were incapable of reading CD-R media (if you're buying a DVD drive, make sure you don't get one of these lemons). As a result, standalone and computer DVD drives are quite capable of playing music CDs and reading CD-ROMs. This backward compatibility is one of the most compelling features of the new technology.

Like CDs, DVDs are 1.2mm thick — even double-layer DVDs. They are usually 12cm in diameter, although technically an 8cm variant exists (which is almost never used; it has a capacity of 1.4G per side for a single-layer disc and 2.6G for a dual-layer disc). To look at, DVDs are almost indistinguishable from CD-ROMs, although those with an eye for detail may note the much finer track pitch of DVD.

The performance of DVD drives is a tricky question. To support DVD-video, the drive must deliver data at a constant rate of 1.38M per second. This is known as 1x DVD, just as 150K per second is 1x CD speed. To do this, it uses a constant linear velocity mechanism (see last month's Technobabble for a description of what this means), although constant angular velocity drives are already in production. In addition to its DVD speed rating, DVD drives will also have a CD speed rating, which indicates the speed at which they can read CD-ROMs.

The first DVD drives available were naturally 1x, and these are the ones to be wary of when buying a DVD drive; it was these very drives that did not initially support CD-R. The second generation of drives were generally 2x DVD drives, and supported CD-R. Faster drives will soon be available — Sony is rumoured to be delivering a 5x drive later this year.



## The other flavours of DVD

Like CD, DVD has spawned a number of variations. The first and most common is DVD video, which uses a set of standard data types to deliver movies to not just computers, but to consumer DVD players as well. It's a very handy replacement for laser disc, without the requirement for monstrous discs to store video. It uses the ISO's MPEG-2 compression technology to store video data and possibly audio data on the disc. Dolby's AC-3 compression scheme is proving very popular as a replacement for MPEG-audio, however, because of its greater quality and support for 5.1 channels (five satellite speakers and one sub-woofer). Just over two hours of video can be stored on a single-sided, single-layer DVD.

DVD-video has a number of features that differentiate it from a VHS player. The flexibility of its digital nature allows it to store multiple audio tracks for different languages, numerous subtitle tracks which can be switched on and off, and menus on the DVD for jumping directly to sections of the movie. As with music CDs, access is random, so you can jump to any point in the video instantly, and there's no need to rewind when you've finished. DVDs also last longer than VHS tapes, the quality of the recorded material doesn't deteriorate and DVDs are much cheaper to produce. Pausing is also clearer, although the nature of MPEG-2 makes a 'quick finder' function difficult to implement.

The biggest bugbear with DVD-video at this stage is regional coding. The major movie studios have divided up the world into six regions (Australia is in Zone 4, along with New Zealand and Latin America) in order to control distribution times of movies. Movies can be encoded for a particular region, and only devices sold in that region will be able to play them, so it is generally little good for an Australian with a Zone 4 player to try to buy Zone 1 movies from the US. Movies do not have to be encoded, however, and those that aren't can be played anywhere. Additionally, if you're lucky enough to have a Zone 0 player, then you should be able to play movies from any zone, but work is currently under

way to overcome this. Regional coding is the main reason why we have so few titles in Australia — as you might expect, Zone 4 is way down on the US-based studios' publishing list.

Then there's Divx. Divx discs can only be played for 48 hours after first being played. Beyond that time they refuse to work without proper authorisation and payment to the copyright holders. The plan: sell Divx discs for a few dollars each in video stores — they never have to be returned, and the people who bought them can only use them for a short period of time. Divx faces quite a bit of opposition from consumers and even some studios, so it may never catch on. Divx

only for those interested in data archiving or in mastering DVDs, DVD-R is a write-once medium that can be used to burn data of any type onto the surface of a disc.

The technology that is used in DVD-R is very similar to that used in CD-R: a coating of a dye polymer which is permanently changed by a highly focused laser beam. A thin layer of metal is then applied over the top of the dye to provide reflectivity for the read laser. A DVD-R disc can only be single-layered at this stage, although double-sided discs are possible. Each side can store up to 3.95G of data. Theoretically, DVD-R discs can be read using normal DVD players.

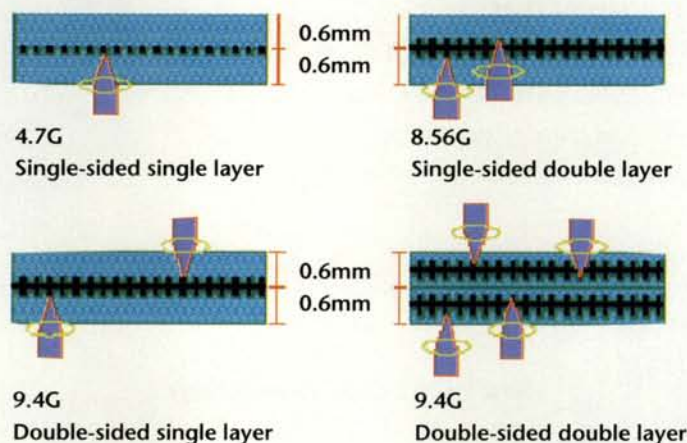
The real battle at the moment revolves around the market for rewritable DVD discs, which are touted as being a replacement for all kinds of consumer storage media, from audio tape to VHS. The potential is exciting, but standards wrangling has thrown a spanner in the works.

Essentially, there are two standards in the offing: DVD-RAM and DVD+RW. Both do very similar things in slightly different ways, working in much the same way as a phase-change disc (discussed in last month's Technobabble) or a CD+RW. They both allow random read and write access to the

disc (so it acts just like a hard disk, albeit a lot slower), and both have large capacities, although not as much as DVD-ROM. DVD-RAM drives enable a capacity of 2.6G per side, while the proposed DVD+RW drives have capacities of 3G per side. The former requires a caddy, the latter doesn't.

DVD-RAM is the standard defined by the DVD Forum, the group that described the initial DVD specification, while DVD+RW is the product of a splinter group, comprising a number of companies, most notably Hewlett-Packard, Philips and Sony. The standards are incompatible, although both include backward compatibility with DVD-ROM discs. This unfortunate splintering of the standards, reputedly over the issue of royalties, looks set to muddy the already murky DVD waters, and to have the unfortunate effect of delaying the delivery of the technology. Until it is resolved, it looks like CD+RW is what we're stuck with. ■

## The different capacities of DVD



discs cannot be read in a normal DVD drive, although Divx drives will be able to play DVD movies.

Music companies are also looking to capitalise on the greater storage capacity of DVD. A DVD-audio specification is still in the works, and it may change in the near future, but at the moment it looks something like this: audio sampled at 96kHz with samples of 24-bit size. CD-audio has a 48kHz sample rate and a 16-bit sample size (we've listened to both, and it takes an expert ear to tell the difference). Even with the greater amount of data to store audio of this quality, DVD offers much longer playing times than the 78 minutes CD is capable of.

## Writable and rewritable

As with CD, there are writable DVD drives and discs available, but they cost far more than a typical computer journalist could afford. A technology that is really



# If all monitors were the same, we would not be in business...

the latests from **CTX** - The Monitors Specialists



## HIGH CONTRAST CRT

- For those who know their monitor, they know the value of having High Contrast CRT.
- For the discerning users

Available in 19" (1995UE) and 21" (2195UE)

## TRINITRON TUBE

- Exceptional crispy flicker free picture
- 0.25 dot pitch with a maximum resolution of 1600 x 1200
- When only the best is good enough

Available in 17" (1792UA)



## New SHORT LENGTH Technology

- Short Length CRT
- Take up to 30% less space
- Quality without the bulkiness

Available in 17" (1769SL)



## XGA LCD DISPLAY

- The ultimate space saver
- Available in 14.5" and 10.4"



on all monitors.  
underwritten by AIG (American Home Assurance)  
1800 toll free support.  
One year return to base warranty for LCD Displays.

...quality should be affordable...



# When quality matters...

*Octek, we may not be as well known as some, but we are certainly better than most. Octek, affordable quality. From entry level systems to the high-end servers, quality and reliability remain our main priority.*

## **OCTEK SS SERVERS, SOLUTIONS FOR THE SMALL TO MEDIUM BUSINESSES**

### MAINBOARDS

Choice of mainboards. From Octek LX board to Intel® N440BX Server Board with LANdesk® Server Management Software, Server Management Instrumentation and Emergency Management Port.

### PROCESSORS

Choice of single or dual Intel® Pentium® II Processors. From 266 Mhz to 450Mhz.

### RAM MEMORY

From 64Mb to 512Mb

### HARD DISK DRIVE

SCSI Hard Disk drive for optimal data transfer. Up to 80 Mbps. From 4Gb to 18Gb

### CD ROM DRIVE

Choice of SCSI or IDE interface. 24x or 32x

### NETWORK ADAPTOR

Intel EtherExpress™ 10/100 for fast network performance

### NETWORK OPERATING SYSTEM SUPPORTED

Includes: Windows NT, Microsoft BackOffice Small Business Server, Novell Netware/Intranetware, Unix, Windows 95/98



## **OCTEK SW WORKSTATIONS**

- Choice of Intel® Celeron™ 266Mhz processor to Intel® 450 Mhz Pentium® II processor
- Choice of 2.5Gb to 10Gb ultra ATA HDD
- From 32 Mb to 256Mb SDRAM
- From 4Mb to 8Mb AGP graphics card
- 32x CD-ROM + Sound + Speakers
- Choice of 15" to 21" high performance monitors
- Choice of internal or external fax/modem
- Microsoft Intellimouse \*MediaTouch keyboard
- Choice of Windows 98 or Windows NT Workstation

from  
**\$1990**

### WE CONFIGURE SYSTEMS TO SUIT YOUR REQUIREMENTS.

All Octek Servers and PCs are manufactured and tested under stringent conditions as per standard procedures in accordance with ISO9002 requirements.

 *We Deliver Better Tech ....*  
**Octek**  
Manufactured by  
Ocean Office Automation Pty. Ltd.

 [www.ocean.aust.com](http://www.ocean.aust.com)

Quality  
Endorsed  
Company  
ISO 9002 Lic 6184  
Standards Australia

**CALL 132286**  
Over 100 outlets nationwide



You can find pretty much any information you want on the Internet.  
Here's the lowdown on finding it fast. **By Daniel Rutter**

# Step by Step

**P**lenty of people say they can't find what they want on the Web, though they know it must be there. This is partly the fault of the Internet's legendary anarchic structure, but with a little practice anyone can find data like a pro.

To find what you're looking for on the Net, you need to know how to search, and you need to know where to search. The 'how' part is the one most people forget, so I'll tackle that first. The URLs for the sites mentioned in this column are printed at the end.

## Stopwords, operators and wildcards

There's nothing wrong with broad search terms if you don't mind an avalanche of 'hits', but the more carefully you construct your search 'string' the less you're going to have to sift the results. 'String' is the computer term for any sequence of characters, including spaces; searching is about the only place you still hear the word in general computing parlance. Another relevant word from days of yore is 'syntax'. A little time spent learning syntax, and a little thought put into your search string, can save you a lot of time poring over reams of close-but-no-cigar links or painstakingly revising your search string. Common words like 'the' or 'and' are called 'stopwords'; they're so common

cat-and-mouse information that you are looking for.

Wildcards are characters that match one or more other characters. The simple asterisk (\*), by convention, matches any number of incidences, including none, of any string. The question mark traditionally matches any single character. They can both be used to broaden your search without forcing you to enter a tedious 'or list' of every form of a doubtful word. Can't remember whether it's Hindenberg or Hindenburg? 'Hindenb?rg' will do. Likewise, 'win\*98' will match 'Windows 98', 'Win98', 'Win 98' and any other string starting and ending with the right letters.

Most search engines are not, by default, case sensitive, so 'rolf harris' will match any instance of the name, regardless of how it's capitalised. Many popular searchers, like AltaVista and Infoseek, turn on case sensitivity if you use capitalisation anywhere in your string. So while 'foo' matches Foo, foo, FOO and foO, 'Foo' matches only Foo.

For real search power, you have to get into Boolean logic, named after its inventor, 19th century Irish mathematician George Boole. The standard Boolean operators are AND, OR, NOT or NEAR, and between them they let you focus a search very finely.

By default, practically all search engines treat all entered terms as if they had AND between them; only pages featuring all of the terms will be displayed. But to find, say, references to Widgetsoft products for Windows and OS/2, but not references to WidgetMail, you could enter 'widgetsoft AND (windows OR os/2) NOT widgetmail'.

Note the parentheses. They group terms and operators together so other operators can deal with the bracketed section as a whole. Without them, in this case, you'd be finding what you wanted, but also any page that contained the term 'os/2' but not the term 'widgetmail'. Nested brackets are allowed, and should be handled competently by any well-written engine.

The NEAR operator varies in behaviour depending on the search engine; some engines, like AltaVista, treat 'foo NEAR bar' as meaning 'foo within 10 characters of bar', while others let you configure the acceptable distance apart the terms can be.

Different engines have their own shortcuts for and extensions to the Boolean oper-



ators. Some engines let you use &, ! and ! for AND, OR, and NOT, and some use a plus sign in front of a term to mean 'this term must be present' and a minus sign for NOT.

Every search engine that supports non-obvious search modifiers like Boolean operations should have these modifiers explained in the Help file. Many engines have basic and advanced interfaces, so people doing simple searches aren't intimidated by extra features. Check the help pages. Extra features unavailable from the meta-searchers, like matching files of a particular kind or pages in a particular date range, can help winnow out valuable information in those annoying situations when you know what you're after but can't quite put it into words.

## Where to search

Now that you know how to look for things, let's get into where you should be looking. Many users use only whatever default search engine comes up when they hit the search button in their browser, and aren't too picky with their search string. Do your searches this way and you'll get far too many results, yet may still miss out on the hits you're really looking for because of the limitations of the engine you use.

For general Web searches, the best engine to use is all of them, via a meta-searcher of some kind. A meta-searcher is a site or program that takes your search query and feeds it to several search engines, then collates their results and presents them with duplicates pruned out. Even the best search engines only index a portion of the Web, so using several at once gives notably higher chances of finding what you want.

For my general searches, I use WebFerret. WebFerret is a Windows program that



that search engines don't pay any attention to them in a search string, unless they're part of a quoted string. So a search for *tom and jerry* is the same as a search for *tom jerry* and will get you about a zillion things you don't want. But a search for "tom and jerry" will get you the



feeds your string to a list of engines (all the big names plus a few more — you can pick which ones to use) and gives you a list of hits that you can sort by page name, search engine or URL. It integrates neatly into the Start menu's Find section, and it can keep a history of past searches. WebFerret also automatically updates the engines it searches and the syntax it uses, so it always does a pretty good job of getting what you ask for.

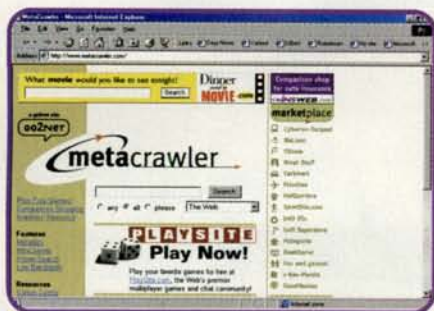
WebFerret has its limitations, though. It can't search Usenet, and the default everything-on setting makes it likely that the less selective engines will snow you under with unwanted data. WebFerret's search sophistication also stops with quoted strings — no fancy logical operators here. But hey, it's free, and you'll find it on this month's cover CD.

If you'd rather use a Web site than an outboard program for your combosearches, try MetaCrawler or ProFusion.

## Yahoo's strengths

You should go to Yahoo if you're just looking for a company's Web site, or any other site whose name you have a good idea of, or if you're just looking for a selection of sites on a subject. This helps when you've already found one site of the kind you're after; find that site on Yahoo, then click the area identifier link above the site name to see everything else in that section.

Yahoo only indexes a small fraction of the Web's pages, but because the site owners get to describe their sites and put them in appropriate categories, it really cuts through the noise for less esoteric searches. Yahoo also 'falls through' to an AltaVista search after it's exhausted its own index,



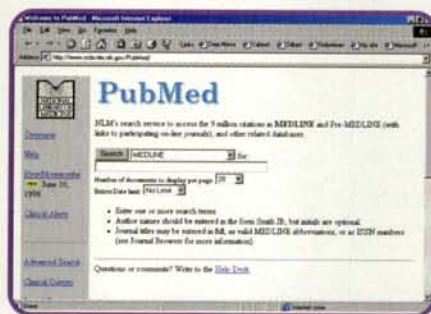
so it's possible you'll get what you need even if Yahoo doesn't list it.

## Searching Usenet

Usenet newsgroups are frequently a lot more useful than Web pages, simply

because much more data has been posted to Usenet over the years than has made it onto the Web. Newsgroups are also the way to go if you're looking for information on something that's only just happened, since Web pages on a subject usually take a while to be built, while newsgroup denizens can be counted on to sound off 10 seconds after the event.

For this sort of total immediacy you'll need to fire up a newsreader and check out the relevant groups yourself; but if you can stand reading messages that are a day or two old, head for Deja News. Other sites offer Usenet searching, but they either send their requests to Deja News (HotBot does this) or have a much smaller database. Reference.com and AltaVista's Usenet search functions can't hold a candle to Deja News — although Reference.com does index recent posts to various email lists, which Deja News doesn't.



Deja News' Power Search lets you restrict your search to one or more newsgroups, with wildcard support; so 'rec.pets.' matches lots of pet newsgroups. You can also specifically search by subject, author and date range. And whenever you're looking at a message, you can choose to view the 'thread' of the messages it forms a part of, often catching other, similarly named threads as well. Alternatively you can choose to view the message author's posting profile, which is an excellent way to judge the credibility of a poster, find more messages from someone especially amusing or erudite, or just snoop into someone's online activities. Deja News also lets you read news and post to newsgroups once you've registered with them, which makes it easy to chase up more information.

Here's one time-saving tip for Usenet searching: if you're searching for the answer to a question, and you see one or more threads of messages which, from their title, seem to be dealing with that subject, don't bother looking at the first message in the thread. Concentrate on all of the 'Re:<subject>' messages instead. The



initial message is probably just asking the same question as you are, and whatever sections of its text are relevant will generally be quoted in the replies.

## Specialised searchers

The other search resources you use depends on your interests. Databases and other information repositories of all types are being made Web-accessible, so you can, for instance, check out US patents, the huge Medline medical abstracts database, piles of information on the Australian Government — you name it. The one thing just about all of the huge online databases have in common is that they support Boolean search terms, so the basic search string skills you use on the Web will also stand you in good stead when searching these sites. ■

## URLs

### Australian Government's Entry Point

<http://www.nla.gov.au/oz/gov/>

### Deja News

<http://www.dejanews.com/>

### Medline

<http://www.ncbi.nlm.nih.gov/PubMed/>

### MetaCrawler

<http://www.metacrawler.com/>

### ProFusion

<http://www.profusion.com/>

### US Patent Bibliographic Database

[http://patents.cnidr.org/patbib\\_index.html](http://patents.cnidr.org/patbib_index.html)

### WebFerretPRO

<http://www.ferretsoft.com/>

### Yahoo

<http://www.yahoo.com/>

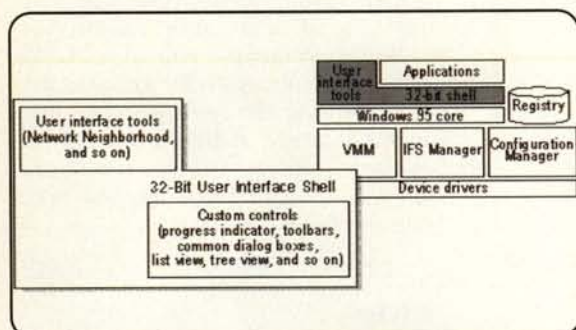


*Getting bored of Explorer? Finding the traditional way of using Windows a little inefficient? Do something about it.* **By Kieran McNamee**

## Windows 95

### The basic Windows 95 architecture

The Windows 95 operating system is composed of a number of separate components. The diagram below (taken from the Windows 95 Resource Kit help file) illustrates the basic components of the operating system.



At the lowest level there are device drivers that provide support for all system hardware. Above the device driver level lies the VMM (Virtual Machine Manager), IFSMGR (Installable File System Manager), and the Configuration Manager. Between the Windows 95 core and the applications that you use is the shell. The shell is the user interface that controls Windows, and is better known as Explorer.

By definition, the shell provides a way for you to interact with the operating system. Explorer, the 32-bit user interface shell of Windows 95, sets a standard for the use and display of information within Windows — but it isn't the only shell available.

### Alternative shells

Using an alternative shell is a practice usually performed by Linux. With the combination of X Window and Window managers (effectively the 'shell'), the Unix user interface has become a lot more user-friendly.

As Windows 95 already has a shell

there hasn't been a real need for alternative shells. There are instances where manufacturers modify the Explorer shell so that the computer has identifying features of the company that manufactured the computer, but the user interface remains primarily the same. Recently, a number of alternative shells have been created to replace Windows 95's Explorer shell.

Replacing the shell of Windows 95 is not a difficult task. The rest of this article will look at some of the alternative shells available to Windows 95 users and how to install them.

### Installation

Finding alternative shells can be a tough task. For this reason, some of the better freeware and evaluation shells have been included on [apcmag.cd](http://apcmag.cd).

If the install files have been archived in a zip file, then first unzip them using WinZip (also available on [apcmag.cd](http://apcmag.cd)). It's a good idea to always read through the entire README.TXT file in the install files before attempting the installation.

Some shells do not replace the Explorer shell; instead they are loaded as a normal program and sit on top of the Explorer shell. Others, such as LiteStep and OpenView, require that the SYSTEM.INI file be edited manually so that they replace the Explorer shell. This involves changing the [boot] entry of shell=explorer.exe, to the name and location of your new shell. When you want to uninstall one of these shells you have to change the entry in the SYSTEM.INI back to EXPLORER.EXE.

Once a new shell is installed be sure to allow enough time to get a feel for the new interface. It might not appeal to you straight away but after customising everything, familiarity will take hold and you may decide to discard the Explorer shell you have been confined to for so long.

### A brand new look

The LiteStep shell is based on the X Window AfterStep shell and its author promotes it as a "cool and stable alternative to Microsoft's shell".

Replacing the Start menu is a pop-up menu which can be accessed anywhere by right-clicking. LiteStep also incorporates a wharf toolbar which sits at the right of the screen and holds your most commonly used applications, as well as some modules. These modules include a CPU monitor, Virtual Window Manager (VWM) and a clock which can be synchronised using a time server on the Internet.

The VWM is particularly impressive. It consists of two small panels in the bottom right-hand corner of the screen which represent the windows that are currently open. You can use the VWM to switch between windows by clicking on the separate panels or dragging one panel on top of the other.

The only problem with the wharf toolbar is that it is set up with a number of



shortcuts to default applications — presumably the author's favourites. Unless you have the same program and it is in the same place that the author had it, you will just get an error message telling you it's not there.

Configuring LiteStep and the toolbar to accommodate your needs is done through



a file called STEP.RC. There is no in-depth help file, but the README.TXT file and comments in the STEP.RC file explain fairly well how to change settings and create icons on the toolbar for your most used programs.

OpenView is another shell replacement based on the AfterStep shell for X Window. For this reason it looks a lot like the LiteStep shell. The main difference between the two shells is that OpenView does not have a selection of default icons already set up. OpenView, however, does use a configuration utility to set up the toolbar as opposed to LiteStep's STEP.RC text file. Have a look at both OpenView and LiteStep to see which one you will find easier to set up, because you will benefit most with a shell that is configured to your liking.

MomShell is an enhancement to the Explorer shell that is loaded as part of your Startup group. MomShell adds an easy-to-



use panel of buttons that allows quick access to your programs.

The main window of MomShell can be split into a number of 'pages' so that applications can be categorised. Internet programs can be kept on one page, utilities on a different page, and games on another. MomShell also has a monitor that keeps track of the CPU load, the percentage of free resources, swap file usage

and the amount of free disk space. The MomShell icon in the System tray can be set up for instant access to commonly used functions such as changing the resolution and disabling the screensaver.

## I wish this PC was a Mac, or even an Amiga

WinMac is not exactly an alternative shell but it will add a Macintosh feel to your Windows 95 machine. Your desktop stays basically the same except for a Mac menu bar (in either System 7 or Mac OS 8 format) at the top of your screen.

WinMac's greatest use will be for those making a move from a Mac to a PC. There will still be an unfamiliar Start menu and a two-button mouse to contend with but the familiarity of the menu bar at the top of the screen may make the transition to a PC a little easier.

The WinMac menu bar can be set to Always on Top so that your applications remain below the menu bar. There was a minor bug when we used WinMac: it caused a program to be loaded too high up on the screen, making the title bar inaccessible. Adjusting the size of the program's window fixed the problem.

Also included with the WinMac installation files is the Mac95Pack. If you're willing to put in the effort you can go that extra step to make your Windows 95 machine look like a Mac with this assortment of sounds, wallpapers, icons, and fonts, as well as start-up and shut-down screens.

To all those readers who are chomping at the bit to get their Windows 95 machines looking and running like an old Amiga Workbench, there's both good and bad news. The good news is there is someone working on an alternative shell that will make all this possible; the bad news is that there is only a demo available of what the shell will look like. For



those interested, the demo is available on **apcmag.cd**.

## How about some security?

WinU runs on top of the Explorer shell, providing a user interface that can be customised with security or productivity in mind. With WinU in place a computer can be set up to allow only certain types of programs to be run. It is perfect for places such as libraries, workplaces and homes, where access to the whole computer is not desired.

WinU has a ton of features — too many to mention here. Some of the more notable features include three levels of security control, automatic timeouts of programs, Web browser monitoring and remote administration.

WinU can be set up to start on bootup and the only way to exit it or change the settings is with a password. Ctrl-Alt-Del reboots can be denied; the CD-ROM drive door can be locked; even the keyboard can be disabled if you like. There is also the ability to analyse information gathered by WinU through reports and graphs.

WinU is a very sophisticated product; for this reason it comes at a price. The full version costs \$99, but the 30-day evaluation on **apcmag.cd** will reveal it is money well spent if you are looking for a secure user interface. ■



Display Director

### Display Director

The SyncMaster Display Director lets you access menus, in five languages, that control screen functions. Special features include Moiré Control and Expanded View capability.

To look and listen to the future, call 1300 369 660.

## SyncMaster™ Total Performance Monitors



A new generation of multimedia monitors.

**SAMSUNG**  
ELECTRONICS  
CHALLENGE THE LIMITS



*Harnessing the power of the command prompt.*

**By Christopher Relf**

# OS/2 Warp

**A**s most regular readers know, the praises of the command prompt have been sung many times in this column — often it's easier and more logical to use the command prompt, especially if you want extended control over applications. Sure, we are all used to the old DOS 6.22 commands like DIR, XCOPY, and FORMAT, but most people don't know the extended power of the OS/2 command line and associated third-party shells.

## Stacking commands

The ability to specify several commands from a command line at once has been around since OS/2 Version 1.0. Using stacked commands, you can execute several tasks at once, so you can go away and do other things. A few of the special stacking characters are as follows:

**&** Processes an additional command on the command line, regardless of the success or failure of the previous command. For example, DIR C: & DIR D:, or COPY \*.txt F: & COPY \*.dat F:.

**&&** Similar to & except that it waits until the previous command has been successfully completed, and terminates if it has not. A good example of this would be C: & CD \TEMP & DEL \*.TMP — a very useful line to put in your CONFIG.SYS.

**||** The opposite to &&, but it only processes an additional command, if the previous one has failed. Say your temporary directory could be either \temp or \tmp; your command line would then be C: & CD \TEMP || CD \TMP & DEL \*.TMP. This example shows how different stack characters can be mixed and matched on one command line.

**^** This character 'escapes' the special character set in case you want to use one of them as an output. For example, if you wanted to echo "peas & carrots" to the screen, the command would be: ECHO peas ^& carrots.

Here's an example of how all these characters could be used together: COPY C:\INFO.TXT A: && DEL C:\INFO.TXT || ECHO Copy ^& Delete error. This attempts to copy the file INFO.TXT to the A: drive. If the write is successful, the original on the C: drive is deleted, and the command terminates. If the write is not successful, the original is left alone, and a 'Copy & Delete

error' message is echoed to the screen. Simple? You'll get the hang of it!

## Redirecting output and input

Once you have the output you want, you may not always require it to be displayed to the screen. Our DIR command can be sent to a printer or instead can be saved to file. To do this, we use a set of functions called 'redirection', and each of these functions uses its own special characters:

**">"** This special character sends the output of the requested command to a specific device or filename that you supply. For example: DIR ">" PRN sends the current directory listing to the printer on LPT1. Be careful — if you send the output of commands to a file (DIR ">" FILENAME.TXT), the ">" command will overwrite any previously existing files of the same name.

**">>"** This special character is much like the ">" character, except that it adds or appends the output to the device. For example: DIR ">>" FILENAME.TXT will add the current directory listing to the end



of the file FILENAME.TXT — if it doesn't exist, it is created. Obviously, this special character doesn't have much use if you are sending your output to the printer, unless you are using it as a stacked command.

**"<"** The above output redirection characters seem simple enough, but now we can also redirect input using this character. Hard to get your head around it? Here's an example: you need to be able to frequently delete a directory that may contain files; an appropriate batch file (let's call it KILLDIR.BAT) would contain the following lines:

```
DEL %1 "<" Y.DAT
RD %1
```

This deletes all of the files in the directory you name at the command prompt (placed into switch %1, that is, KILLDIR DOCS), and then deletes the directory. The crucial element is another file you have to create called Y.DAT, which simply contains the character Y, followed by a carriage return. What does it do? Firstly, the delete file command is called, and then, rather than the command prompt asking if you are sure that you want all of the files in the current directory deleted, it is passed the data in Y.DAT, which tells the command 'yes'. Then the directory is deleted.

Redirection is particularly useful if you're trying to debug a problem system. Rather than your PC spewing error messages to the screen, you can redirect them to a file to be printed out later. This technique is also very helpful if you are having problems with a specific piece of hardware or software and you need to record all error messages and send them to the manufacturer. Also, if your error messages are minor, redirecting them to a file rather than to the screen means that the PC can complete its task (for example, booting up) without waiting for user input.

## Piping and filtering

Let's get even further into the useful command prompt. Piping and filtering have been used for years on both OS/2 and Unix systems, simply because they make our command prompt life so much easier.

At some time, you may need the output of one command to be the input of the next command, and this is called 'piping'. Originally a Unix command, piping does exactly that — it pipes information from one command to another. The general syntax to pipe is COMMAND1 | COMMAND2. Try to think up a few ways to use piping, and you will see just how much of a time-saver it really is.

To use piping efficiently, several commands have been written to specifically make use of its capabilities, and the most famous of this is MORE. For example, say a particular command scrolls an abundant amount of information to the screen, and you don't have anywhere near enough time to read it before it all disappears. Simply pipe your command to a MORE filter.



We know that a long directory listing can be made to pause after each page using the DIR /P switch — but let's just say we didn't. We can pipe it to MORE by typing the following: DIR | MORE. A basic example, but what if you want to know information about your favourite operating system's threads, processes, shared memory, and so on? Try using the PSTAT command without piping it to MORE.

## Replacing the Command Processor

If you are not happy with the way the OS/2 Command Processor handles commands, or if you need one that has an extended 'vocabulary', you can easily replace it with a third-party one.

The command processor is a file called CMD.EXE, and a fantastic replacement for it is 4OS2.

The ability to use the 'old' commands that you are used to, while enhancing them with extra switches, and even adding extra commands, is all here in 4OS2. Available for OS/2, DOS, Windows 95 and NT, you can install the '4' series on each of your operating systems, and they behave almost identically — a great capability if you use OS/2 at home, and Windows at work. The list of features is extensive, but here are just a few.

4OS2 includes the ability to modify and re-execute previous commands using the built-in command line editor (similar to doskey, but with many more features). You can redefine commands, create new ones, and even allocate frequently used ones to a single keystroke. 4OS2 also has a search-like function which is able to locate files or directories anywhere on your system. Probably the most useful is the *Extended Directory Searches*, which gives you the ability to change to a directory anywhere on your system by entering only part of its name. No more cd... five times to get

back to the root, and then back through another branch. Of course, 4OS2 has an embedded file viewer, and you can even copy, delete, and rename *groups* of files and directories — not just individual ones. A great feature of 4OS2 is the ability to highlight special files with different colours in your directory tree — imagine all \*.EXE files glowing orange, while all your favourite document files are green. Fantastic!

To demonstrate the extended switch set of 4OS2, let's look at a couple of examples. The traditional DIR command has about eight options (or switches). The



4OS2 version has about 30, including the ability to:

- Display system and hidden files alongside your normal files:  
DIR /a
- Display only certain files:  
DIR \*.DOC; \*.TXT; \*.WPD
- List the directory in one, two, four, or five columns:  
DIR (as expected)  
DIR /2  
DIR /4  
DIR /w (as expected)
- Offer extended wildcard support for characters like \* and ?. 4OS2 allows you to use them with more flexibility than the traditional CMD.EXE. You can display all filenames that start with the letter 'a' (DIR a\*), end with the letter 'a' (DIR \*a), or have

the letter 'a' anywhere in them (DIR \*a\*).

As well as enhancing existing commands, 4OS2 includes several extra commands, including:

- The ability to search for files, and then their contents; if you wanted to list the text files that contained the word 'computer', type FFIND /t"computer" \*.TXT.
- You can 'point and shoot' — if (in a full screen mode) you want to select a few files to copy. Type select copy (\*.\*) a: and then, using the arrows on your keyboard, select the files you want to copy to the A: drive.
- A very useful addition is the except extension. How many times have you zipped up 40 files, and then wanted to delete all of those files, except the ZIP file and the README.TXT? It's easy: just type

EXCEPT (\*.ZIP;README.TXT) DEL \*.\*

As you can see, 4OS2's command set is very intuitive.

Also, ever-useful is the batch file — a file with the extension BAT — where you can string together a series of commands so that your stacking doesn't become too messy. 4OS2 supports traditional batch files, and includes an extended set. In the improved batch 'language', you can even define IF, THEN, ELSE logic and switch exception handling, and the new-improved batch files reportedly run two to 10 times faster than under the traditional CMD.EXE. Also, if you want to create neat-looking menu batch files, 4OS2 has several added bits, including the ability to draw lines and boxes, and you can have colour text as well.

You can find out more about 4OS2 at <http://www.jpsoft.com> — or just download the shareware trial version of 4OS2 from this month's **apcmag.cd**.



### UltraClear™ Coating

The SyncMaster UltraClear coating has been designed to eliminate glare and distortion from the screen. Combined with an advanced dynamic focus system, and an Invar Shadow Mask, SyncMaster Total Performance Monitors now deliver brighter, sharper and more accurate images for all applications. To look and listen to the future, call 1300 369 660.

## SyncMaster™ Total Performance Monitors



A new generation of multimedia monitors.

**SAMSUNG**  
ELECTRONICS  
CHALLENGE THE LIMITS



# Mac OS

**M**icrosoft Office 98's new installation method (drag one folder to your hard disk then launch any of the applications) is about as easy as it gets, but a little extra effort pays dividends. In this article, we look at just some of the customisations possible with Word 98.

Word 98 makes good use of contextual menus, but the feature conflicts with Mac OS's Contextual Menus. The way around it is to go to Word's Help menu and select Turn off Contextual Menus in Microsoft Word. If it's not there, pull the menu again — I've noticed the Help menu isn't always fully populated the first time it is used. If that fails, you may need to update the Contextual Menu software to the version that comes with Apple Data Detectors 1.0.2.

Another effect of this incompatibility is that FinderPop's Ctrl-free Contextual Menu pop-up feature doesn't work either, so you have to hold down the Ctrl key to see Word's contextual menus.

When the background spell checker puts a red squiggle under a word, the quickest way to correct it or add it to your custom dictionary is to use the contextual menu. Hold down the Ctrl key and click on the word, and you'll be given spelling suggestions and the option to add it to your custom dictionary or ignore it. Similarly, green squiggles indicate questionable grammar, and a Ctrl-click brings up suggested changes.

For this to work, you must create a custom dictionary. Starting with a blank document, select Preferences from the Tools menu, then choose the Spelling & Grammar tab. Click Dictionaries, and then New, choose an appropriate name and

To set the default font, go to the Format menu and select Font. In the resulting dialog box, choose the font and style, and click the Default button. There may be situations where you might want a default style other than plain, but I suspect they are few and far between.

If you want the Letter Wizard to automatically pick up your postal address, go to Preferences in the Tools menu, click the User Information tab and type in the address.

The default Office Assistant (the animated help window) is an early model Mac on legs: cute, but irrelevant to Power Macintosh users. It's also 'busy' and noisy to the point of being distracting. Alternative assistants can be installed from the Office CD-ROM by running the Value Pack installer. Choose between installed Assistants by clicking the current one (use the Office Assistant toolbar button if it isn't showing), the Options button and then the Gallery tab. If you like the animated paperclip default in Office 97 for Windows, look for Clippit; but I find Office Logo is a more peaceful choice. Regardless of the Assistant you choose, you can turn off the sound effects from its Options tab.

Have a good look through the Value Pack as there are several useful items including extra templates and Wizards, clip media, extra fonts, the equation editor, extra help files (notably for Visual Basic for Applications), additional dictionaries, and Microsoft Office Manager (MOM). MOM is the control panel that adds a menu giving quick access to Office components and other features — earlier versions didn't have the best reputation, but the one in Office 98 has worked well for me.

*Installing Office 98 is just the start.*

**By Stephen Withers**

dow by about six lines of 12-point text. The obvious answer is to turn them all off.

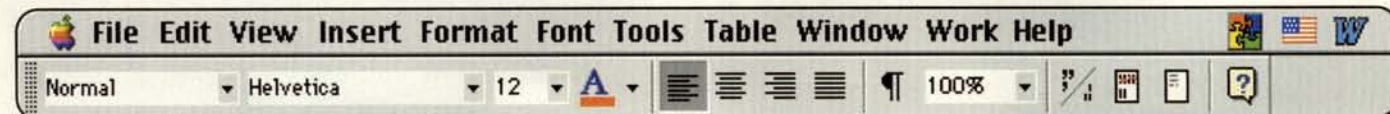
The status bar does very little for me; I don't need to know which page, line or column I'm on, and the animated Spelling and Grammar Status icon is a distraction. Double-clicking the icon jumps from one detected error to the next, but that's only at its best when a few errors are spread through a long document. Ditch the bar by selecting Preferences from the Tools menu, clicking the View tab and deselecting the Status bar checkbox.

Toolbars are more useful, but be selective. A custom toolbar is the only way to go. The Standard toolbar has some handy buttons, but I'm convinced you should learn the virtually universal keyboard shortcuts for New, Open, Save, Print, Cut, Copy and Paste.

To create your own toolbar, select Customize from the Tools menu, then click the Toolbars tab and the New button. Give it an appropriate name, and leave it available to the Normal template. Click Close and the new, empty toolbar will appear on your screen.

The easiest way to populate it is to drag and drop items from existing toolbars, but remember to hold down the Option key so the items are copied, not moved. The tools you pick will depend on your working style and the type of documents you produce. I started with Style, Font, Font Size, Font Color and the four paragraph-alignment buttons from the Formatting toolbar, plus Show/Hide, Zoom and Office Assistant from the Standard toolbar.

If you want to add dividing lines to group certain tools (as used in several of the standard toolbars), drag the tool furthest to the left in each group slightly to



location for your dictionary, and finish by clicking the next two OK buttons.

The contextual menu also makes it easy to use the thesaurus: point to a word, Ctrl-click and choose from the list of synonyms.

A few other settings should be customised sooner rather than later.

## Toolbars

Out of the box, Word presents you with two active toolbars (Standard and Formatting). Coupled with the normal menu bar and the status bar, this takes up an appreciable amount of screen real estate on a 14in monitor, reducing a maximised win-

the right and a line will appear. If you wish, you can dock your new toolbar by dragging it to any edge of the screen or any other docked toolbar.

The next task is to add tools for operations that you frequently perform, but for which there are no predefined buttons or keyboard shortcuts. Sometimes you'll want



to add a specific command to the toolbar. I need to keep a close eye on the number of words in my documents, so I've dragged Word Count from the Commands tab of the Tools/Customize dialog to my toolbar.

If you want to adjust particular settings from a toolbar, you may need to delve into the world of macros. Some of my documents must contain straight quotation marks, but in others I want 'real' curly quotes, so I created a macro that toggles the state of AutoCorrect's 'Replace as you type straight quotes with smart quotes' setting.

If you record a macro for this action, its length may surprise you. All the 'AutoFormat as you type' settings are set even though you only changed one of them. Additionally, I wanted the macro to toggle the setting, not explicitly set it to on or off. A recording is a good place to start as it shows the statements you need and is easily edited.

Select Tools, Macro, Record New Macro; enter an appropriate name; perform the operations required; and then click the Stop button in the Record toolbar.

To add the macro to the toolbar, the sequence is Tools, Customize, Commands tab, and then select Macros from the Category list. Now drag your macro from the Commands list to the toolbar. Back in the dialog box, pick Default Style from the Modify Selection pop-up, followed by Edit Button Image. This lets you create a custom button for your macro.

It turns out that a single line of code will toggle the quotes setting:

```
Options.AutoFormatAsYouTypeReplaceQuotes = Not Options.AutoFormatAsYouTypeReplaceQuotes
```

Another of my favourites involves inserting a name and address from a contact manager. Word 98 offers an address book, but it doesn't provide all the features of a contact manager or PIM such as Claris Organizer (recently sold to 3Com to become part of the PalmPilot software for the Mac). Linking to a non-Office program in this way requires a mix of Visual Basic for Applications (VBA) and AppleScript. Note that VBA is quite different to Word 6's WordBasic.

In this case, the VBA is quite simple:

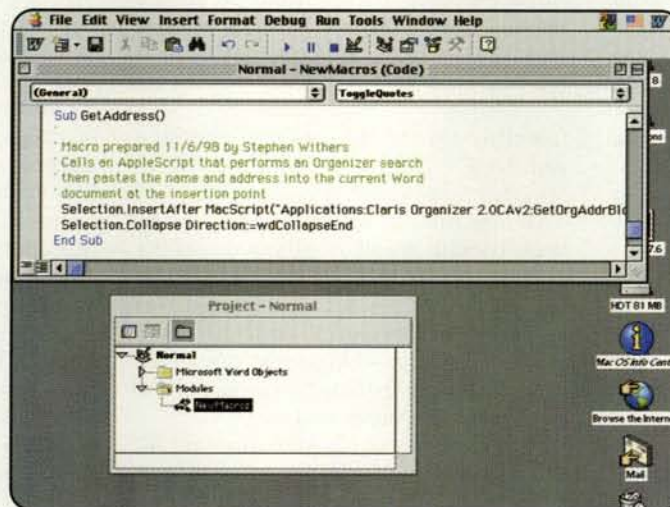
```
Sub GetAddress()  
    Selection.InsertAfter MacScript("Applica-  
tions:Claris Organizer 2.0CAv2:GetOrgAddr-
```

```
Block")
```

```
    Selection.Collapse Direction:=wdCol-  
lapseEnd  
End Sub
```

The MacScript function calls an AppleScript. In this case, the parameter is the path to a script file (GetOrgAddrBlock), but one or more AppleScript statements are acceptable too. You'll almost certainly have to change the path, even if you use the same name for the script.

Selection.InsertAfter inserts the follow-



ing parameter (that is the value returned by my AppleScript) after the current selection, so the user must position the insertion point before running the macro.

The Selection.Collapse statement effectively deselects the inserted address, moving the insertion point after the postcode.

Now for the GetOrgAddrBlock AppleScript:

```
tell application "Claris Organizer 2.0"  
    activate  
    set ret to ASCII character 13  
    set theContact to locate contact  
    tell NameInfo of contact theContact  
        set theName to first name & " " &  
last name & ret & company  
    end tell  
    tell AddressRec of Address1 of con-  
tact theContact  
        set theAddress to street & ret &  
city & " " & state & " " & zip  
    end tell  
    set NameAndAddress to theName &  
ret & theAddress  
end tell  
tell application "Microsoft Word"  
    activate  
end tell  
return NameAndAddress
```

I won't go through it line by line, but the script lets the user select a contact, then assembles and returns a string containing the name, company name and address. Word is activated near the end of the script to bring it back to the foreground.

Create a button for the macro, add it to your custom toolbar, and addressing a letter becomes a snap.

It is a good idea to quit and relaunch Word after you've customised a toolbar. The toolbar doesn't appear to be stored as part of a normal Save operation, so if something goes badly wrong before you quit, your nice new button can disappear.

## Updates

Microsoft has released a couple of updates for Office 98 that you should know about.

The Remove Office 98 utility tucked inside the Value Pack is more thorough in removing the suite than the regular installer, but uses the Microsoft Office 98 library to locate the Microsoft Office 98 folder. If, for some reason, the library has been moved to the Extensions folder within the System Folder, the latter gets trashed

instead. To avoid this, leave Office's files where the installer puts them, and to be doubly sure, download the new Remove Office 98 from <http://www.microsoft.com/macoffice/productinfo/98dl/o98u.htm>.

The second problem occurs on G3 systems and others with at least 512K of cache memory, but only when they run some kinds of VBA-compiled code. This affects the Memo, Resume, Newsletter, Calendar and Agenda Wizards, and possibly some third-party products. Get the Memo-Resume Wizard Patch from <http://www.microsoft.com/macoffice/productinfo/98dl/mrw.htm> regardless, as you might not remember this problem if you subsequently install a cache or processor.

Keep an eye on <http://www.microsoft.com/macoffice/freestuff/default.htm> for Office-related goodies, but at the time of writing the only item of particular interest was the supplementary dictionary of computer terminology.

For an independent look at issues surrounding Office 98, see MacFixIt's *Troubleshooting Microsoft Office 98* report at <http://www.macfixit.com/reports/msoffice98.shtml>. ■



*Everything you wanted to know about the Red Hat Package Manager. By Geoffrey Bennett*

# Linux

**R**ed Hat Package Manager (RPM) simplifies the job of managing a Linux system by using 'packages'. (A package is a related collection of files that can be manipulated as a group.) An RPM package is similar to a ZIP or tar.gz archive, but in addition to being a collection of files, it contains extra information that allows it to be easily installed, removed and upgraded. The RPM program which is used to do the actual work of managing packages also maintains a database of installed software so that questions such as 'what do I have installed?' or 'where did this file come from?' can be easily answered.

Despite the name, RPM is not limited to being used under Red Hat Linux. It is being developed as completely open software (available for anyone's use) and it is licensed under the GNU Public License, which guarantees that it will always remain that way.

The best way to install RPM is to get it along with a Linux distribution that uses it, but the latest version of RPM is always available by anonymous FTP from `ftp.rpm.org`, in the directory `/pub/rpm`.

RPM packages generally come in files with names similar to 'gnuplot-3.5-9.i386.rpm'. This filename indicates the file is an RPM package containing the gnuplot program, Version 3.5 Release 9, and that it is compiled for the i386 architecture (this includes all CPUs backwardly compatible with the Intel 80386). The release number serves to differentiate between multiple releases of a package for the same version of software.

Note that the filename of a package is just a convention. RPM does not care what the filename is as the information it uses is completely contained within the package itself.

To install the above gnuplot package, you would use the '-i' (install) switch to RPM and specify the filename of the package:

```
rpm -i gnuplot-3.5-9.i386.rpm
```

If you have a number of packages to install, just list them all on the command line one after the other.

Before actually installing a package, RPM needs to perform a few checks. It first checks if any software required by the

package is installed (for example, a program written in the Perl language would require the Perl interpreter to be installed). RPM then checks if the package conflicts with any other packages or files you may have installed beforehand. So if you already had another version of gnuplot installed, RPM would warn you with a message such as:

```
/usr/bin/gnuplot conflicts with file from gnuplot-3.5-8
```

If RPM finds no reason for it to not continue with an install, it will run any of the commands that may need to be run before the package's files can be installed. For example, the PostgreSQL database server requires a 'postgres' account to be created. These tasks are included as a part of the package in the 'pre-install script'.

The next step is for RPM to install all the files that make up the package, and following that, any commands that may need to be run after the package is installed are executed (this is the 'post-install' script). RPM's final job when installing a package is to update its database with information about the package that was just installed.

RPM will, by default, not produce any output if the installation was successful (no news is good news). If you want feedback during package installation, you can use the '-v' and '-h' switches, which stand for 'verbose' and 'hash' respectively. 'Verbose' means RPM will print the name of the package it is currently installing, and 'hash' means RPM will print a number of '#' signs to indicate its progress. For example:

```
rpm -ivh gnuplot-3.5-9.i386.rpm gnuplot
#####
#####
```

To remove a package from your system use the '-e' switch to RPM followed by the package name. For example, if you installed the gnuplot package above you could type the following to erase it:

```
rpm -e gnuplot
```

If for some reason you have two versions of the same package installed, you can

specify which one you mean by adding on the version number or both the version and release numbers:

```
rpm -e gnuplot-3.5
rpm -e gnuplot-3.5-9
```

Note that when erasing a package, you just type a package name, not the full filename. If you want to erase more than one package, you can list them all on the same command line.

When erasing a package, many of the steps RPM performs are similar to an installation. It first checks there are no packages that depend on the one you are about to remove (for example, you will be warned about removing the Perl interpreter if there are any programs written in Perl installed). RPM then runs any pre-uninstall script that may be associated with the package, removes the package's files, and runs any post-uninstall script. Lastly, it updates its database by removing the entries for that package.

Upgrading an RPM package is very similar to doing an installation.

If you had, for example, gnuplot-3.5-8 installed, and then downloaded gnuplot-3.5-9 with the intention of upgrading, you could type:

```
rpm -U gnuplot-3.5-9.i386.rpm
```

Internally to RPM, upgrading a package is done by first installing the new package and then removing the old package. RPM won't remove files that are still owned by any other packages so, this does work correctly despite the seemingly odd order in which it is done. Similar to installing a package, RPM will, by default do it silently, but if you want feedback, you can use the '-v' and '-h' switches.

If you would like RPM to ignore any dependencies when installing, erasing, or upgrading packages, add the '--nodeps' switch to your RPM command line. Using this switch is usually not recommended, because as far as RPM knows, the software you are about to install won't work because something that it requires isn't there. However, if you know better than RPM, you could type `rpm -ivh --nodeps` followed by the package filename.



You can override RPM's decision to not let you overwrite files or packages with the '--force' switch. As the name implies, you may break another package if you use this, but it might be more appropriate to remove whatever the new package is conflicting with instead of forcing it.

## Configuration file handling

When installing, erasing, or upgrading a package, it is possible there will be a configuration file for that package which RPM may want to overwrite or remove. As modifying configuration files can represent a lot of work over time in setting up a Linux system, it would be unreasonable for RPM to blow away your changes just because you wanted to perform an upgrade from one version of a package to another.

In general, if there is any doubt as to what should happen to any customised configuration files, they will be backed up with either an '.rpmorig' or '.rpmsave' extension before being overwritten or erased. Complete details on configuration file handling are available in the book *Maximum RPM* from Red Hat.

## Verifying packages

One of the design criteria for RPM was that it should be easy to check that a package is still installed correctly. The database RPM maintains during installs, uninstalls and upgrades makes this an easy task. When verifying a package, RPM checks: all the files in the package are still present; all packages that this package relies on are still installed; and that all the attributes of each file in the package (such as the owner, size and last modification time) are still the same.

RPM can also run a custom verification script (created by the package author) to check anything else that isn't included in the above list.

If you want to verify one package, use the '-V' flag followed by the package name. For example, to verify the `initscripts` package, you could type:

```
rpm -V initscripts
```

Or to verify all installed packages, you could type:

```
rpm -Va
```

As for RPM installations, no news is good news; if nothing is output, that means all files are still as they were

when you installed the package.

If verification of some files in the package fails, RPM will output one line per file along these lines:

```
S.5....T c /etc/inittab
```

This looks a bit strange, but it is a compact way to represent exactly what isn't right with the `/etc/inittab` file. Each of the first eight characters on the line refers to a particular attribute of the file that RPM has verified. A '.' means that that particular attribute was verified, and a letter means that that particular attribute did not verify. The letter 'c' means that this file is a configuration file. Since configuration files are meant to change, they will not always verify successfully.

The table below lists the attributes each letter represents.

### File attributes verified by -V

<b>S</b>	Size
<b>M</b>	Permissions ('mode')
<b>S</b>	MD5 checksum
<b>D</b>	Major/minor numbers (only for device files)
<b>L</b>	Link contents (only for symbolic links)
<b>U</b>	Owner ('user')
<b>G</b>	Group
<b>T</b>	Modification time

## Querying packages

Package querying is where RPM's database really becomes useful. All queries are performed with the '-q' switch, which are followed by switches to specify:

- What package(s) to query.
- What information to retrieve from the package(s) (this is optional).

If you don't specify any information to retrieve, the default is to print the package name, version, and release number. First, a few different ways to specify what package(s) to query:

- Directly by specifying the installed package name: `rpm -q gnuplot`
- All installed packages: `rpm -qa` (to make this rather long list more useful, try `rpm -qa | sort | less` or `rpm -qa | grep . . .`)
- By specifying a file that an installed package owns (this can be used to find out what package a file belongs to): `rpm -qf /etc/ftpaccess`

- By specifying a package file: `rpm -qf wu-ftp-2.4.2b16-4.i386.rpm`

Here are a few of the information options available:

- General information: '-i'
- The list of files in the package: '-l'
- The list of configuration or documentation files in the package: '-c' or '-d' respectively.

Each of these options can be combined in any way that makes sense; the table below contains a number of examples.

RPM also has a very powerful custom query option. It is beyond the scope of this article to explain it, but as an example, to show the top 20 disk-space-hogging packages and their sizes in a neat table, you could type:

```
rpm -qa --queryformat '%-25(NAME) %8(SIZE)\n' | sort -rn +1 | head -20
```

### Example RPM query commands

```
rpm -ql grep
```

List files in the `grep` package.

```
rpm -qi grep
```

Show information for the `grep` package.

```
rpm -qpil dump-0.3-13.i386.rpm
```

Show information and list files for the `dump-0.3-13.i386.rpm` package file.

```
rpm -qf /bin/bash
```

Find out what package `/bin/bash` came from.

```
rpm -qdf /bin/bash
```

List the documentation files corresponding to the package that `/bin/bash` came from.

To learn more about RPM, there are a number of sources of information. The primary one is Ed Bailey's *Maximum RPM* book, published by Red Hat Software. As well as information on using RPM from a user's point of view, it contains information on all the ins and outs of building your own packages. *Maximum RPM* is available for download at the RPM Web site in PostScript or LaTeX formats.

The RPM Web site is located at <http://www.rpm.org/>, and it contains a few links to other useful RPM-related documents. The `rpm-list@redhat.com` electronic mailing list is for discussion of RPM-related issues. Archives of the list and information on subscribing can be found at <http://archive.redhat.com/rpm-list/>. ■



## Developers Corner

Over the years I've worked with many programming languages, yet C and C++ remain my firm favourites. One of the main reasons for this is the very same reason that many people hate those two languages: the flexibility of C/C++ pointers. Properly understood, pointers are your best friends. Poorly understood, they are your worst nightmare. In the next two columns we are going to try to explain them properly.

### The humble array

Let's start with something simple.

```
int iArr[10];
iArr
```

is an array of 10 integers. The first of these is `iArr[0]` and the last is `iArr[9]`. If you try to access `iArr[10]`, the compiler may well let you; however, the result may be catastrophic. If you assign a value to `iArr[10]` you are writing into memory that was not designated for your use. If you're lucky, the program will crash. If you're unlucky, the program may appear to work properly, but will produce the wrong result. If you're really, really unlucky, you may corrupt the operating system and accidentally unformat the hard disk. Isn't programming fun?

```
char cArr[12];
cArr
```

is an array of 12 characters. It may hold 12 individual characters or a string of 11 characters. Character strings are always terminated with a 'nul' character. This is a character with a numeric value of zero, usually written `'\0'`. This is not to be confused with a '0' character, which has the ASCII value of 48. So to store the string "12345" you actually need an array of six characters: five for the string and one for the terminator.

### Pointers

```
char *pChar;
int *plnt;
```

A pointer is an address variable. It can contain the address of a single value or an array. The type of the pointer usually implies something about the contents of the memory it points to. In the declarations above: `pChar` is intended to point at a character variable or an array of characters. Similarly, `plnt` is intended to point to an integer or an array of integers. I use the word *intended* as there is actually nothing to stop you violating that.

```
int i; /* Declare an integer */
int *plnt; /* Declare an integer pointer */
char *pChar; /* Declare a character pointer */

plnt = &i; /* Initialise plnt to point to "i" */
*plnt = 5; /* The integer pointed to by plnt (ie. "i") */
/* is assigned the value 5 */
printf( "%d\n", i ); /* This will output 5 */
pChar = (char *)&i; /* This is legal, but not */
/* necessarily sensible */
*pChar = 'X'; /* This may be a problem! */
printf( "%d\n", i ); /* What this does is platform dependent */
```

The pointer `pChar` points at some memory intended to hold an integer. We have tricked the compiler into using part of that memory to hold a character. As an integer is generally bigger than a character, there will be enough space to hold a character — so we won't corrupt memory. However part, but not all, the integer "i" has been altered — and the current value of "i" is probably not anything useful.

There are sometimes good reasons to trick the compiler like that, but make sure you know what you are doing as the side effects can sometimes surprise you.

```
int *plnt;
*plnt = 5;
```

This is one of the most common beginner's errors. `plnt` is a pointer *capable* of pointing to an integer, *but it does not yet point to one*. `plnt` is uninitialised. It con-

*The intricate science of pointers.*

**By Michael Smith**

tains a random value, which means it points to some random part of memory. Assigning a value to `*plnt` will overwrite some random part of memory. We've already discussed some of the delightful things that can result.

```
void *pVoid;
pVoid
```

is a special case: a generic pointer. Nothing should be assumed about the address it might hold. This is useful in cases where the pointer might point to different types of data.

```
#define PINT 0
#define PDOUBLE 1
void printit( int datatype, void *pData )
{
    int *plnt;
    double *pDouble;

    switch (datatype) {
        case PINT:
            plnt = (int *)pData;
            printf( "%d\n", *plnt );
            break;
        case PDOUBLE:
            pDouble = (double *)pData;
            printf( "%f\n", *pDouble );
            break;
    }
}
```

### Dynamic memory allocation

There are plenty of useful things that can be done with pointers, simply by pointing them at variables and arrays. However, one of the great sources of flexibility in C and C++ is the use of pointers with dynamically allocated memory. Memory can be allocated when it's needed, resized if necessary, then freed up when it's no longer required.

```
void some_func( int buffer_size )
{
    char *pBuffer;
    pBuffer = malloc( buffer_size );
```



```

if (pBuffer==NULL) {
    printf( "Allocation failed\n" );
    return;
}
/* do a bunch of processing . . . */
free( pBuffer );
}

```

There are several different memory allocation functions available. As this column is about pointers, rather than memory allo-

cation, I won't go into too much detail; but I will give a couple of quick warnings.

The size passed to `malloc()` is the number of bytes to allocate, not the number of elements. If you allocate an array of characters, each character will be one byte, so it's pretty simple. If you allocate any other types you have to be more careful. The best way is to use the `sizeof()` macro.

```
int *pInt = malloc( 20*sizeof(int) );
```

When the function `some_func()` is completed, the pointer `pBuffer` ceases to exist. However, the memory allocated by `malloc()` is not automatically returned to the system. Unless you call `free()` the memory will be lost. This is known as a *memory leak*.

Next month we'll continue exploring pointers, and tackle that most frightening of concepts: pointer arithmetic.■

Each character has a numeric value; which is its internal representation. A very high proportion of modern computers use the ASCII (American Standard Code for Information Interchange) format for encoding characters. Some older computers, particularly IBM mainframe and minicomputers, use the EBCDIC (Extended Binary-coded Decimal Interchange Code) format. Other formats do exist, but they are getting pretty rare.

If you want to know the numeric value of any character, you can write a short program like this (also found on [apcmag.cd](#)):

```

#include <stdio.h>
#include <ctype.h>

int main( void )
{
    int ch;

    while ( (ch=getchar()) != EOF ) {
        if (isprint(ch)) {
            /* PRINTABLE CHARACTERS */
            printf( "\n[%c] - 0x%2X (%d)",
                (char)ch, ch, ch );
        } else {
            /* NON-PRINTABLE CHARS */
            printf( "\n[ ] - 0x%2X (%d)", ch,
                ch );
        }
        if (ch=="\n") putchar( ch );
    }
    return 0;
}

```

Sidebar `qsort.c`

```

#include <stdio.h>
#include <stdlib.h>
#include <string.h>

char **ReadData(FILE *fIn, int *pnLines);
int Compare( void *p1, void *p2 );
void SortData( char **pData, int nLines );
void WriteData( FILE *fOut, char **pData,
    int nLines );
void DisposeData(char **pData, int nLines);

int main( void )
{
    char **pData;
    FILE *fIn = stdin;
    FILE *fOut = stdout;
    int nLines;

```

```

    pData = ReadData( fIn, &nLines );
    if (!pData) return 1;
    SortData( pData, nLines);
    WriteData( fOut, pData, nLines );
    DisposeData( pData, nLines );

    return 0;
}

/*****
 * Because this cleanup code is called *
 * from more than one place, I have *
 * made it a macro to avoid *
 * maintaining it in multiple places. *
 *****/
#define CLEAN_UP() \
{ \
    DisposeData( pData, nLines ); \
    free( pszLine ); \
    fprintf( stderr, "Out of memory\n" ); \
}

char **ReadData( FILE *fIn, int *pnLines )
{
    int nLines = 0;
    int maxLines = 1024;
    int lineLen = 4096;
    char **pData, **pTmp;
    char *pszLine;

    /* ALLOCATE A BUFFER TO READ IN A
    SINGLE LINE */
    pszLine = malloc( lineLen );
    if (!pszLine) return NULL;

    /* ALLOCATE AN ARRAY OF POINTERS
    TO HOLD DATA */
    pData = malloc( maxLines*sizeof(char *) );
    if (!pData) return NULL;

    /* WHILE THERE ARE MORE LINES */
    while (fgets(pszLine, lineLen, fIn)) {

        if (nLines==maxLines) {
            /* OUT OF POINTERS, REALLOC() */
            /* ARRAY TO MAKE IT BIGGER */
            maxLines *= 2;
            pTmp = realloc( pData, maxLines );
            if (pTmp) {
                /* REALLOC WORKED, SAVE NEW
                POINTER */
                pData = pTmp;
            } else {
                /* REALLOC FAILED, CLEANUP AND

```

```

EXIT */
        CLEAN_UP();
        return NULL;
    }
    /* DUPLICATE THE LINE WHICH WAS
    READ IN */
    pData[nLines] = strdup( pszLine );
    if (!pData[nLines]) {
        /* DUPLICATION FAILED */
        CLEAN_UP();
        return NULL;
    }
    nLines++;
}
/* FREE LINE BUFFER */
free( pszLine );
*pnLines = nLines;
return pData;
}

int Compare(const void *p1, const void *p2)
{
    char *pc1 = *(char **)p1;
    char *pc2 = *(char **)p2;

    return strcmp( pc1, pc2 );
}

void SortData( char **pData, int nLines )
{
    qsort( pData, nLines, sizeof(char *), Compare );
}

void WriteData( FILE *fOut, char **pData,
    int nLines )
{
    int i;

    for (i=0; i<nLines; i++)
        fputs( pData[i], fOut );
}

void DisposeData( char **pData, int nLines )
{
    int i;

    if (pData) {
        for (i=0; i<nLines; i++)
            if (pData[i]) free( pData[i] );
        free( pData );
    }
}

```



*In this month's JavaScript column, we go all philosophical for a change. By Travis Simon*

# JavaScript

**H**ave you ever wondered why you were put on the Earth? And how the world as we know it came into existence? Do you know how the rotary engine works? The universe is a phenomenally complex place, so rich with detail that comprehending it is well beyond the means of any single individual.

I don't know how computers work, do you? Sure, I know that the CPU reads the first byte of an instruction to determine the instruction's length and then reads the entire instruction. The CPU then optionally does a microcode lookup and executes the instruction. Even at this level, we haven't discussed what the set of available instructions is, how the CPU reads those instructions, what microcode is, what a byte is, how the instructions are represented, where the instructions are kept, and so on. I think you get the picture.

Despite my fundamental ignorance of the computer, however, I can use it. I'm writing this article on a computer. And, even though I don't understand the full intricacies of CPU instructions, I've generated computer instructions for different processors successfully. Furthermore, I (along with a friend) assembled this very computer — for which, and from which, I have generated CPU instructions — from many separate pieces.

## Abstraction

The reason that humans are able to function in a society that they don't fully understand is because of a process called abstraction. Abstraction is the ability to strip away details to gain a better understanding of the overall picture. For example, I can say that I do in fact understand how computers work: input devices send information to the processing unit; the processing unit gathers instructions and executes them; the output device then communicates the results of those calculations to the user.

Abstraction is the means by which we can function in an ever-changing environment. If you learn not to hit a tree while you're driving a car, you don't have to learn not to hit each individual tree on the planet (you did learn that, didn't you?). You can reduce the amount of complexity by stripping away unnecessary details.

So what does any of this have to do with JavaScript? Well, sit back because I'm about to tell you.

## Program complexity

Real-world programs are nasty beasts. You have seen by now that in JavaScript (and indeed, any programming language) you have to account for every instruction and every piece of data in your program. While this is not that difficult if you are doing something stupid like displaying the contents of a string in the colours of the rainbow, it can become extremely taxing in larger programs. Look at the menu bar on any program and pick one of the items. Think about what data that control needs, and what instructions it carries out. And then think about coordinating and managing all of the controls in the entire program! As you can see, it could quickly become something of a nightmare.

The idea behind abstraction is to hide complexity from yourself and other programmers. Recall from the article on the top-down approach to programming (see APC December 1997, page 164) that an easy way to approach programming challenges is to divide the problem into its components, and then implement them in the reverse order. Abstraction adds the notion of hiding the details of components as you build the program.

Do you remember how the algorithm for creating and retrieving cookies works? More to the point, should you? I've forgotten the details of its implementation simply because I never see them. In fact, I intentionally go out of my way to hide them from myself! As far as I'm concerned, the only thing that's required to create cookies is the following code:

```
<script language="JavaScript" src="cookies.js">
setCookie("myCookie", "cookieValue");
myValue = getCookie("myCookie");
</script>
```

Contrast that with the original article, which took two pages and examples on the CD to explain!

Note: Hard-core C programmers will notice that I'm going to fudge a little around the edges when I speak about

abstraction in relation to JavaScript. By their very nature, JavaScripts are not as complicated as C programs, and C-style abstraction, even if it were possible, would not provide great rewards in JavaScript. So, if my loose interpretation of abstraction concepts annoys you, you'll just have to grit your teeth.

## Borrowing from the C tradition

I got the idea for applying abstraction to JavaScript from the C language. Almost all non-trivial C programs will include many separate files, each containing data structure definitions and functions for manipulating those data structures. The actual code is pre-compiled, so the source code is not viewable. However, each module has a header file, which defines the functions contained in the code, and offers some guidelines for usage.

Using this approach, the only information available to the programmer is what's provided in the header file. While this sounds limiting, it's actually a blessing. Once you know how to make the appropriate function calls, you can use those modules without thinking about the source code. Using a hypothetical example, imagine a header file that defined a function called `makeButton()` that accepted three arguments — the caption, and the `x` and `y` coordinates for where to place the button. Once you knew this, you could easily place buttons all over your application without knowing how the code worked. Unfortunately, C programming is not quite that easy!

Following along these lines, I've started placing generic functions, such as the cookie functions, in separate files. I also create a text file that contains the necessary code to reference the JavaScript file, as well as some comments explaining how to use the module. An example will clarify this somewhat.

## Using the `src` attribute of the `<script>` tag

Every script presented in this series has used the `<script>` tag with the `language="JavaScript"` attribute. However, you can also use the `src` attribute to specify



an external file that contains the code to be executed. The only stipulation is that the external file be given a JS extension when it is named. For example, I could place the following code in a file called HELLO.JS:

```
alert("Hello world!");
```

I could then create a page called HELLO.HTM to call the code. Assuming that both files were located in the same directory, the code would look like this:

```
<html>
<head>
<title>Hello test</title>
<script language="JavaScript"
src="hello.js">
</script>
<body></body>
</html>
```

Originally, the src attribute was introduced into the language to hide code from users. When you 'view source' of a page with an external script, you can't see the code, and thus can't rip it off. However, I see this as the single greatest drawback to this approach. My first script was a hack job on someone else's code, and it's a great way for beginners to learn the language.

## Header files

For functions and more complicated modules, I create a text file that includes the script tag and src attribute, and bundle it with the module itself. Then, to use the functions, all that is necessary is to cut and paste the text from the 'header' file, and place the module itself in the appropriate directory. For example, the text file included with the cookie functions looks something like:

```
<script language="JavaScript" src="Cook-
ies.js">
<!-- Hide Script
```

```
// The Cookie module
//
// This module provides cookie functions.
// The two functions are getCookie() and set-
Cookie()
//
// The setCookie() function accepts two argu-
ments — both strings.
// The first argument is the name of the
cookie, followed by its value
// (Note: by default, the setCookie function
sets a cookie to expire after
// one year's time)
//
// The getCookie() function accepts one argu-
ment — the name of the cookie
// to retrieve, and returns the value of the
cookie, or null if the cookie
// doesn't exist.
//
// Examples:
//
// setCookie("cookieName", "cookie value");
// if(temp=getCookie("cookieName") != null)
//   alert(temp);
// End script —>
</script>
```

The header file should include enough information for you to know how to use it, and what arguments need to be sent to the function. In the example above, I've included a lot of information because I plan on distributing the code. If I were going to be using the module strictly for my own purposes I might not comment it so thoroughly. And, if you want to get fancy, you could always create the header files in HTML, and make a master document that links to the individual header files.

## Coding larger projects

The single greatest problem that new programmers face (and often experienced programmers as well) is that programs don't

always go the way they're planned. Once a logical error has been introduced to a program, fixing it becomes the most important concern to the developer. Unfortunately, in fixing that problem, the code often becomes dependent on the workaround, and other sections of code will have to accommodate the problem area. Eventually, what was once a small problem will have infected all other areas of code, and the developer will be drowning in the murky waters of implementation-dependent code.

Using the modular approach outlined in this article, however, the emphasis is on separating a logical piece of code from all others and exposing only the necessary functions and data to the other portions of the program. The goal becomes separation of logical components, and not simply 'getting it to work'. Once a module is complete, the developer can forget the details of how the module itself works, and mentally remove themselves from the details, and focus on the big picture.

## The end result

If you discipline yourself and spend a little extra time putting common procedures in external modules, you will build up a library of reusable components. When you need to use one of those functions, it's already packaged in a convenient form, and the time invested in building the library will be rewarded later in productivity.

On this month's **apcmag.cd**, I've included some JavaScript modules and their header files so that you can get a better idea of abstraction and what can be gained with this approach. Feel free to use these modules in your projects, and drop me a note to let me know what you think.

Travis Simon can be contacted via email at [trav@acp.com.au](mailto:trav@acp.com.au).

**apcmag**.pocketbook

EVERYTHING YOU NEED AND NOTHING YOU DON'T

# the Windows 98 pocketbook

The Windows 98 PocketBook is your complete service guide to installing, tuning and running Windows 98. Why waste time and money with overweight, overpriced tomes? The Windows 98 PocketBook has everything you need and nothing you don't. Plus! it comes with a great bonus CD packed with the best shareware and Net tools for the 98 user.

on sale August 3



*Time-saving tools for the modern Web developer.*

**By Lee Borkman**

# HyperText

**I**'ve climbed down off my high horse lately so I can take a good look at the latest crop of high-level Web development tools. Although I do like to get up to my elbows in grubby, low-level HTML coding, there's something attractive about just telling your machine what you want your site to look like, and having it do all of the dirty work for you. In particular, I've been looking at the ever-popular FrontPage from Microsoft, and the less popular, but very stylish, NetObjects Fusion.

For different reasons, I've also been messing around with Adobe's fabulous new Web-oriented graphics utility, Fireworks. These tools are getting pretty powerful, and a thinking Web developer should be on the lookout for ways of getting the job done with less effort or better results. Now, I'm not about to throw away my copy of Allaire's HomeSite, or even Paint Shop Pro — I'm just saying that there's room in the developer's toolbox for some new toys.

FrontPage 98 and NetObjects Fusion 3.0 set the standard for WYSIWYG Web authoring. NetObjects led the way years ago with DTP-like control over page layout, and the automatic generation of navigation controls from a high-level description of the site's structure. NetObjects Fusion 3.0 has made a strong product even stronger. But look out! Microsoft has taken most of NetObjects' good ideas, and made FrontPage 98 a real contender in power and sophistication. There is now no simpler or quicker way to create and maintain a traditionally structured, hierarchical Web site of near-professional standard.

So let's try an example. We've talked about a hypothetical boutique cinema in recent months. I'd like it to have a single-page entrance gallery, leading to

a central information page, and a one-page exit gallery. The central page will have a few sub-pages with session details and coming attractions. That's about all we'll need. A moment's reflection will show that this site is not naturally hierarchical — it is not tree-shaped. Much of the site is actually linear. Nevertheless, with a little imagination, we can represent a linear structure as a tree.

With NetObjects or FrontPage, start by creating a new, blank site. As you create each new page, you can drag and drop it into position on your hierarchy. You can try rearranging the entire structure by dragging pages around. NetObjects is very good at this, but FrontPage will sometimes spit the dummy, saying

the program never has to worry about modifying pre-existing code.

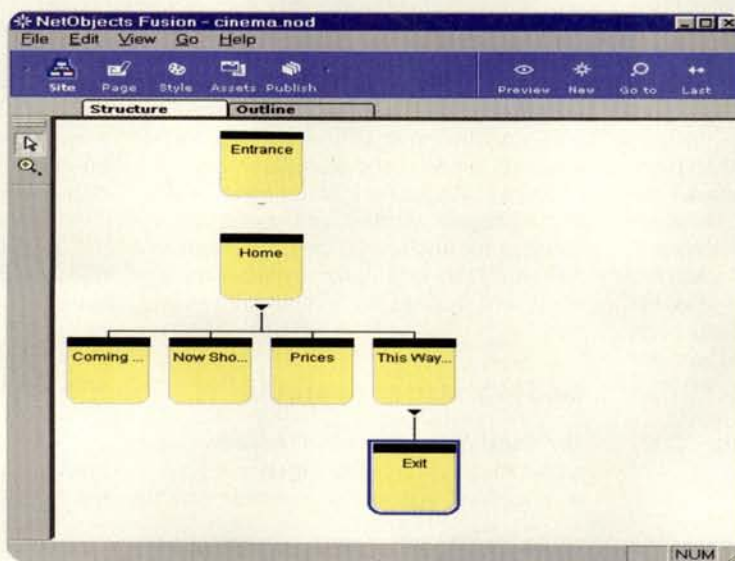
Describing your site's structure at such a high level has some great advantages over hand-coding. Both NetObjects and FrontPage 98 will create all the basic navigation controls for you, including all the necessary images, and will also generate all the HTML, so everything is consistent, and everything works. On any substantial site, this is a remarkable feat. Who needs a link checker when both the links and the target files are all generated at the same time by your authoring software?

A standard page layout would separate the navigation (defining the structure) from the content of each page. A simple border might keep the graphical

navigation buttons at the left, the heading or banner at the top, and a text-only nav bar at the bottom. The centre and right of the page contain the actual content. FrontPage 98 and NetObjects let you define one standard border for your entire site. You can choose which pages will be included in your nav bars at each level of your tree. Use the WYSIWYG page editor to position the nav bars and banner within the page border. You can then proceed to fill your empty structure with content.

Although the common border will be propagated throughout your site, each

page can have its own individual content. FrontPage uses a word-processor-style interface for editing your page content. NetObjects, on the other hand, uses a DTP-style interface that lets you drag objects and text around for precise layout. Be warned, however — NetObjects tries to accomplish all of its layout control using HTML tables. This can produce inefficient (and inelegant) code, and it's also not as precise as you might wish. This is largely due to the discrep-



that it can't save your changes. That's because FrontPage actually makes the changes to the HTML in real time, as you make or modify the high-level structure. Sometimes, it just backs itself into a corner and can't get out. NetObjects Fusion, on the other hand, does not commit itself to any underlying HTML code until you select Preview or Publish. That means that the code is freshly assembled from the high-level site description, and



ancies between various browsers, and the inconsistent manner in which they render Web pages. Unfortunately, this is an inevitable result of the history of HTML, which started as a structural markup language, and was not intended to describe a document's appearance. This history makes the whole concept of WYSIWYG Web authoring seem a little shaky.

There is one more great advantage to building your site from a high-level definition. The entire look and feel of the site can be changed in one operation. NetObjects Fusion has always used 'styles' (don't get this mixed up with cascading style sheets), coordinated sets of graphical and layout elements. Microsoft has incorporated this idea into FrontPage 98, and has wisely chosen the name 'themes'. Both packages will automatically generate images for nav buttons, banners, horizontal rules and backgrounds, which are then incorporated into the resulting Web pages. Styles or themes also define default font faces and colours. All you have to do is define the high-level structure of your site, and you are then free to apply and reapply new themes until you are happy with the result. The great advantage is that you can change your mind easily, while still ensuring your site is consistent and correct.

My advice is to forgo the standard set of themes/styles that come with these packages, and create your own. You will need to create one image for page banners, and one for nav buttons. Then choose the font formatting for the text that will be added to each image. It's really very simple, but it could be well worthwhile farming this task out to a graphic designer. That's one way to get a professional look and feel for your site, while retaining the ability to make swift and consistent changes.

FrontPage 98 also lets you define alternative images for your navigation buttons, which can then be transformed into 'active' buttons, using automatically generated JavaScript rollovers. And that brings us to our third time-saving utility, Macromedia's FireWorks.

Fireworks is a graphics toolkit designed with the Web in mind. Its native format is PNG, the Portable Network

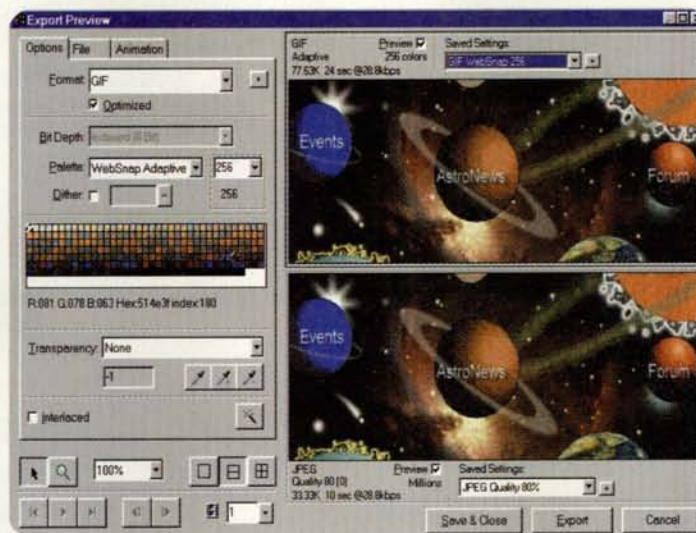
Graphic format (or PNG's Not GIF). PNG is set to replace GIF as the lossless image compression standard for the Web. Fireworks will handle both vector and bitmap objects, and keeps everything in its own separate layer. These multilayered images can be exported to any number of different formats, but Web developers will be particularly interested in GIF animations and JavaScript rollovers.

Let's imagine we want a nav button that changes when the mouse is over the image. In Fireworks, we just create a two-layer image and use the Export option to export as a GIF rollover. Fire-

works uses a simple interface for slicing up your source image. Just drag your mouse across the image to select rectangular 'slices'. For each slice, you can choose the image format, the number of colours and all the other relevant variables. When you hit the export button, the separate image files are created, and an HTML file with code for the table is built as well. If you aren't happy with the results, just go back and change or edit the slices on your source picture.

Even if you don't want to slice up your images, Fireworks is a great help when minimizing bandwidth. When you are deciding on the settings for your exported image, use the Export Wizard to preview your various possibilities side by side. You can display up to four different settings at once. This lets you finetune your JPEG compression ratio smoothing, or the palette and dithering options of your GIFs. If you couldn't save 25% on most of your images, I'd be very surprised.

So I'm changing my ways. Hand-coding still has its place, but the idea of generating files from high-level descriptions is very appealing. Whether it's the structure of a Web site, or the vectors in an image, it makes sense to create and modify at a high level of abstraction, and let your software do whatever low-level trickery is necessary. The result is a faster development cycle, better consistency and fewer mistakes. This approach also helps to develop a healthy top-down approach to analysis and coding. Perhaps the lesson is that we shouldn't get bogged down in the details, when there are perfectly capable software packages that can do it for you. ■



works will prompt you, asking if you want it to generate an HTML page with all the JavaScript code needed to display the image as a rollover. You can actually define up to four layers, which will be used for the MouseUp, MouseOver, MouseDown and OnClick events. Alternatively, a multilayer image could be exported as a GIF animation.

But one of Fireworks' best features is its ability to cut down your image's file size. This is accomplished in two very clever ways. The first is called image slicing. Have you ever been surfing the Web and hit on a page where a large image appears piece by piece, until the whole picture is assembled? This is image slicing. A large image is broken up into rectangular pieces, which are each saved in the most efficient format possible. The separate images are then reassembled by using a borderless HTML table. Consider this common problem. You have got a photographic image with a rich, complex central fig-



Each month this page lists all the Shareware files to be found on **apcmag.cd**. Simply browse to the Workshop section to find the files and related reviews.

# Shareware summary

## Windows 95

### Grand Chess 1.2

An interesting version of chess with an expanded board and a couple of new pieces added.

### TurboGo 4.01

Very good introduction to the great oriental game of Go, with numerous features to help inexperienced players.



### Kyôdai Mahjongg 4.52

Attractive version of the popular solitaire tile-matching game, using traditional mah-jongg tiles. Contains numerous layouts and an editor for rolling your own.

### Solitude 1.28

Large freeware collection of solitaire card games, including most of the old favourites and a couple of new creations, with comprehensive help files.

### LaserChess 98 1.0

Two-player board game bearing similarity to chess. Uses a laser gun and pieces that can bend, reflect, deflect or split the beam.

### RusCell 1.0

Beautifully rendered replacement for the Windows 95 FreeCell solitaire game in 800 by 600 resolution and 16-bit colour.

## OS/2

### Entertainment Pack 2.7g

This is definitely something you should install — as soon as you are bored (or frustrated) with one game, you can go on to the next.

### Matrix 1.3

Not an easy one. Matrix is a game picked up from the farthest corner of the Net. Almost a flat version of Tetris, only with twists.

### Doom 5.7

It was the beginning (that is, if you don't count Wolfenstein 3D) of the revolution.

### PM Maze 1.00a

One hopes that this was just a programming exercise, although it makes a mildly interesting screensaver in Auto mode.

### Sorry 1.00

Surely everyone has played the board game version of Sorry? Not a bad game, although it's lost a lot in transition to the PC.

## Mac

### CD to AIFF 1.2c

CD to AIFF is a nifty little shareware application for encoding AIFF files from audio CD tracks.

### Mpecker Encoder 020b7

This is the only non-commercial MPEG audio encoder for Mac OS. Mpecker allows the encoding of various Layer II and Layer III (otherwise known as MP3) MPEG formats from AIFF files of fixed frequencies.



### ConvertMachine 1.2

Convert Machine is a batch-processing tool for audio files. It is capable of converting files to AIFF, AU, QuickTime, Mac OS and Sound Designer II formats.

### CD Equalizer + Karaoke 3.2

A replacement for the Apple CD Audio

Player with a software 27-band graphic-equalizer.

### Virtual Drummer 3.1

A QuickTime-based package for authoring drum tracks. Uses a multitude of different percussion instruments and styles.

### SndSampler 3.5.2

SndSampler is a fun sound-editing package, which includes a variety of editing tools and filters to produce professional sound effects.

## Linux

### Freeciv

Freeware strategy game for Linux/X in the tradition of Civilization II. Freeciv is highly playable and addictive, and may be played over a network.



### Dumb

Dumb is a free 3D game engine for developing and running games in the class of Doom and Heretic.

### Maelstrom

Maelstrom is an Asteroids-like game for X11. It is freely available and even better than the real thing.

### X-Bomber

X-Bomber is a simple X11 game similar to Super Bomberman.

### Space Boom

Space Boom is an SVGA-based shoot-'em-up game for Linux. It is well designed and has smooth gameplay and support for joystick, MIDI and sound devices.





Australian  
Personal  
Computer

Channel

PRODUCTS FOR RESALE

If *computers* are important  
to *your* business, you  
should talk to

**AVO** Computa-Care.

**AVO COMPUTA-CARE SERVICES** has been designed to suit businesses of all sizes. By turning to AVO, you are getting more than just support and maintenance to keep your business running smoothly. You are enlisting the wholehearted support of true professionals in the computer industry. As a result, your business is bound to feel the benefits of our association one way or another. So, if your computers are important to your business, talk to AVO. Call it a Lifesaver if you like – we call it AVO Computa-Care. And if we cannot fix your problem on-line, we'll be there on-site before you know it. AVO Computa-Care service guarantees that your downtime is minimal. Our safety net stretches from the sleepiest hamlet to the busiest metropolis – so practical assistance is only a phone call away.

**AVO Computa-Care Line**  
----- **9906 2655**

**AVO Electronic Systems Pty Ltd**

29 Dickson Avenue Artarmon NSW 2064

Tel: (02) 9906 2655 Fax: (02) 9906 2735

**AVO Computers Pty Ltd**

Shop 8 99 Mount Street North Sydney NSW 2060

Tel: (02) 9959 3328 Fax: (02) 9959 3373





# SCAN ME

You will find more and more....

Beautiful shape, lightweight body and elegant design, you will fall in love with the appearance of the ARTEC® AM12 at first sight. Examine it more closely, however, and you will find that not only does it look good, it is also intelligent. You just launch the driver, insert the original document, and press a button. The scanner does the rest. The "Automatic Detection" "Automatic Scan" and "Batch Scan" functions make scanning a piece of cake. Of course, let's not forget 3D scanning, color enhancement technology, high scanning speed, 36-bit superior color and 19200-dpi ultra resolution, which we are proud to include in this fine scanner. Yes, the ARTEC® AM12 scanner family is not just beautiful; it is also smart and powerful.

Scan me, You will find more and more....



#### ARTEC® AM12E

- 30-bit true color-over 1 billion colors
- EPP interface, Easy to install; easy to use
- Supports Windows 95, 98 and NT

#### Feature

- Optical resolution 600 x 1200 dpi
- 19200 dpi ultra resolution
- A-4 size; single pass
- Supports Windows 95, 98 and NT
- Long-life cold cathode fluorescent lamp
- Most affordable solution for advanced graphic applications



#### ARTEC® AM12S

- 36-bit true color-over 68 billion colors
- Fully support TWAIN and SCSI-II standards
- Apply to both Macintosh and PC systems



#### ARTEC® 1236P

- CIS scanner
- 36-bit, 600 dpi

ULTIMA ELECTRONICS CORP.

# ARTEC

Distributor

Global Business Technology Int'l Pty Ltd.

Tel: 02-9644 3900 (Sydney)

Fax: 02-9644 3932

All other brand or product names are trademarks or registered trademarks of their respective holders.

Specifications and features are subject to change without notice





# Capture more color!

For true color reproduction, it's difficult to go past the KTX range of scanners. The top-of-the-range KTX 9600 utilises a high-powered 36-bit color model which allows it to capture a whopping 68.7 billion

colors — perfect for when you need to reproduce genuine, true-to-life images. For the everyday user, the KTX 4800 (30-bit color) is great for general purpose scanning at home and in the office.

**KTX 4800**  
30-bit color  
300 x 600 dpi



**KTX 9600**  
36-bit color  
600 x 1200 dpi



**KTX®**

HEAD OFFICE: 60 O'Riordan Street,  
Alexandria NSW (61 2) 9353 9200

SYDNEY: (02) 9906 5550  
PARRAMATTA: (02) 9890 2577  
MELBOURNE: (03) 9416 0099  
ROWVILLE: (03) 9755 5755  
BRISBANE: (07) 3256 0688  
PERTH: (08) 9478 2811  
ADELAIDE: (08) 8346 0599

NEWCASTLE: (02) 4956 8955  
TOWNSVILLE: (07) 4721 6222  
TASMANIA: (03) 6245 0888  
AUCKLAND: (64 9) 358 1108  
CHRISTCHURCH: (64 3) 366 5792  
WELLINGTON: (64 4) 576 0311  
HONG KONG: (852) 2402 3239

TAIWAN: (886 2) 2727 7735  
LONDON: (44 181) 335 3355  
MANCHESTER: (44 161) 406 8844  
PARIS: (33 1) 4151 1450  
NETHERLANDS: (31 294) 43 2975  
JOHANNESBURG: (27 11) 805 6645  
CAPE TOWN: (27 21) 52 4049

DISTRIBUTED BY:

**EDGE COMPUTER**

SAUDI ARABIA: (966 1) 462 1323  
DUBAI: (971 4) 836 378  
KUALA LUMPUR: (60 3) 731 5069  
PENANG: (60 4) 398 3798  
DALLAS: (1 972) 889 3343  
HOUSTON: (1 713) 532 3343  
FREMONT: (1 510) 656 2589

NEW JERSEY: (1 201) 342 4228  
BOSTON: (1 781) 935 0055  
TORONTO: (1 905) 948 0000  
MONTREAL: (1 514) 731 9400  
VANCOUVER: (1 604) 273 9888  
We're on the WORLD WIDE WEB:  
Home Page <http://www.edge.net.au>

Brandnames/trademarks are property of their respective owners. Specifications subject to change without notice.



# NOTEBOOK COMPUTER SPECIALIST



## ACER EXTENSA 368T

**\$2999**

PENTIUM 200 WITH MMX TECHNOLOGY  
32 MB RAM EXPANDABLE TO 144 MB  
2.1 GB ENHANCED IDE HARD DISK  
12.1 TFT SCREEN, 20 SPEED CD-ROM  
56K FAX/MODEM, WINDOWS 95  
THREE YEARS WARRANTY.

Flexirent for

**\$29.00 P/W**

## 56K PCMCIA FAX/MODEM CARD \$279

TOSHIBA 480CDT (P233MMX / 32M / 3.8G / 12.1TFT/16X) \$4399

TOSHIBA 490CDT (PII233 / 32M / 3.8G / 12.1TFT/20X) \$4999

TOSHIBA 490XCDT (PII266 / 32M / 3.8G / 13.3TFT/20X) \$5799

TOSHIBA 320CDT (P266MMX / 32M / 3.8G / 10.4TFT) CALL

TOSHIBA Libretto 100CT (P166MMX / 32M / 2.1 GB / 7.1TFT) CALL

Acer 367D (P200 MMX / 32M / 2.1 G / 12.1 SCC / 20X) \$2299

Acer 710DX (PII 233 / 32M / 2.1 G / 12.1 SCC / 20X) \$3299

Acer 710T (PII 233 / 32M / 3.2 G / 12.1 TFT / 20X) \$4099

Acer 710TE (PII 233 / 32M / 4 G / 13.3 TFT / 20X) \$4999

Acer 7300TE (PII 266 / 64M / 4 G / 13.3 TFT / 20X) CALL

Digital VP 745 (P266 MMX / 32 M / 4G / 20x / 13.3TFT) \$4599

Mitac 5026U (P233MMX / 32M / 2.1G / 12.1TFT/20X) \$2999



**FLEXIRENT  
AVAILABLE**



<b>XIRCOM</b>	33.6 FAX/MODEM	\$279	56K FAX/MODEM	\$379
	33.6 FAX&ETHERNET COMBO			\$479
	56K FAX&ETHERNET COMBO			\$579
<b>NEW</b>	REALPORT 56K FAX&ETHERNET COMBO			\$699

<b>KINGMAX</b>	33.6k FAX/MODEM	\$199,	ETHERNET CARD	\$120
----------------	-----------------	--------	---------------	-------

### RAM FOR NOTEBOOK COMPUTER

16 MB RAM	\$120	32 MB RAM	\$199	64 MB RAM	\$349
2.1 GB HDD	\$399	3.2 GB HDD	\$499	4.0 GB HDD	\$599

**UNIVERSAL CAR ADAPTOR FOR ALL NOTEBOOK** \$299

**CANON BJC 80 COLOR PRINTER WITH INFRARED PORT** \$425

**CANON BJC 50 PRINTER WITH INFRARED PORT** \$625

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

**PLEASE CALL US FOR**

**LATEST PRICE & NEWEST PRODUCTS**



TECHNOCITY 38, 730 GEROGE ST  
SYDNEY, NSW 2000

11/65-75 CAPTAIN COOK DR  
CARINGBAH, NSW 2229

SHOP1, 153 FOREST ROAD  
HURSTVILLE, NSW 2220

**E-mail**

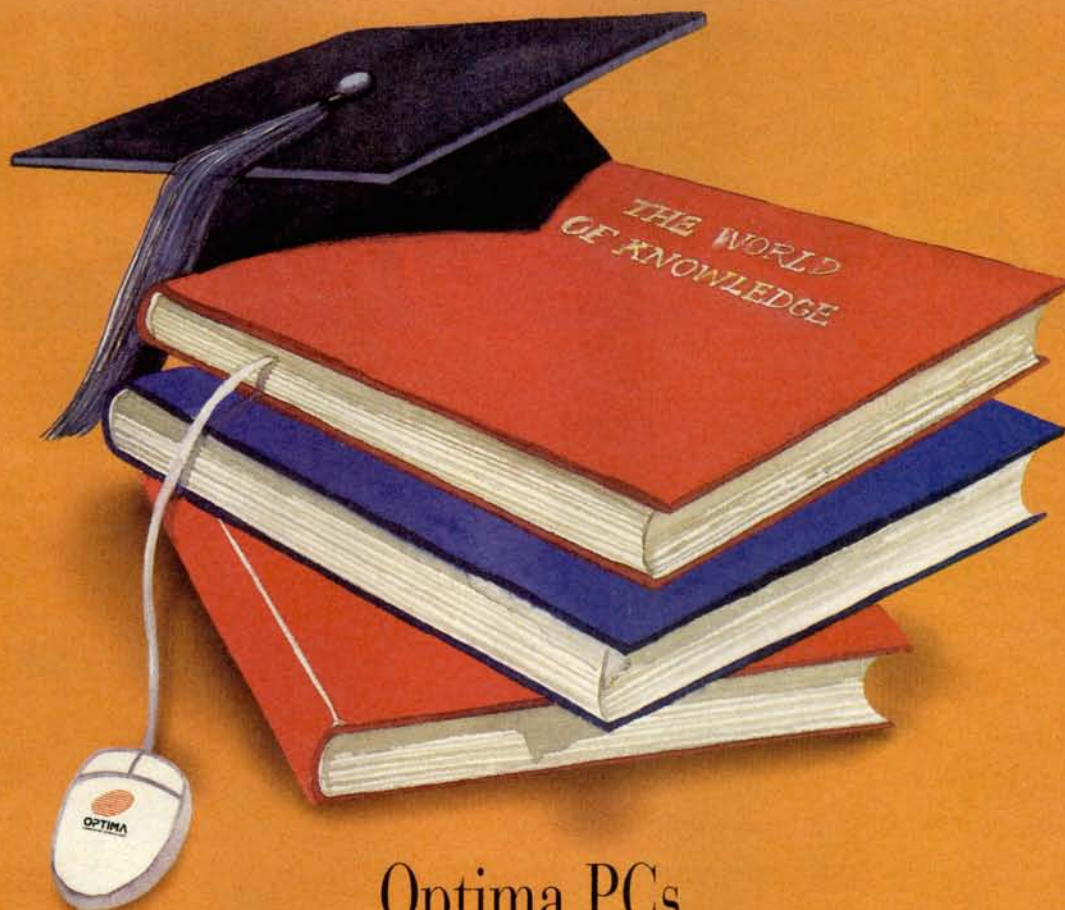
[qplus@alphanet.com.au](mailto:qplus@alphanet.com.au)

TEL: 02 9212 6918 FAX: 02 9212 6924 TEL: 02 9524 6311 FAX: 02 9524 6206 TEL: 02 9586 1000 FAX: 02 9586 1047

**WE ACCEPT ALL CREDIT CARD!  
FREE AUSTRALIA WIDE DELIVERY!**







Optima PCs.  
**An Essential Element  
in Education.**



Over the past few years Optima has become one of the largest computer suppliers to the Australian education market. This has been achieved by focusing exclusively on offering complete hardware and networking solutions to end-users, be they students or teachers.

Our quality and service far exceeds the ISO 9002 Australian Standard, so it's no surprise Optima ranked in the top 5 in APC Magazine Service and Reliability Survey. Ranked second largest local computer manufacturer in Australia in 1997 by IDC, Optima is an essential element in education throughout Australia.

**Head office:**

*48A Egerton Street,*

*Silverwater, NSW 2128*

*Tel: (02) 9841 2777*

*Fax: (02) 9841 2778*

**1800 245 800**

***Global Resources, Total Solutions***



# Subscribe to LAN MAGAZINE and SAVE!

## LAN Magazine

*Solutions for the Network  
and Communications Professional*

**LAN Magazine** is Australia's leading network and communications magazine. **LAN** delivers **timely** and **objective** coverage of issues affecting business technology leaders. Editorial is written **exclusively** for **LAN** to ideally match the unique Australian market by a team of contributors in Australia, New Zealand and the US.

**LAN** focuses on issues, technology, products and solutions — the complete framework to determine business technology strategies.

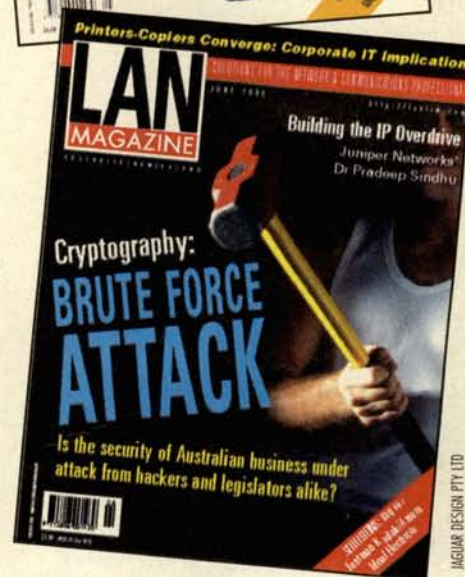
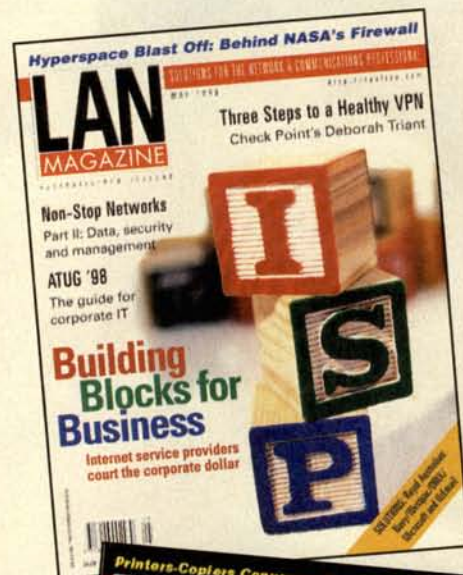
Subscribe to **LAN Magazine** NOW  
Phone 1800 252 515; Sydney (02) 9260 0071

**\$45.00**

**1 year subscription  
(12 issues)  
Save \$21.00**

**\$81.00**

**2 year subscription  
(24 issues)  
Save \$51.00**



**LAN**  
MAGAZINE

100% AUSTRALIAN CONTENT



# PC Supermarket

For advertising details contact  
Alison Watson on (02) 9288 9149

PRODUCTS AND SERVICES FOR DIRECT PURCHASE

## GOLD Fx-pro

Produced and distributed by



Software of Distinction

# LOTTONET™



## Hundreds of Lottonet users win each week



**Why are they winning ? Because Lottonet allows them to play with large systems at extremely low costs. Only losers play with full price systems and go broke quick-smart! Lottonet users pay up to 96 % less and still retain absolutely identical chances of matching the winning numbers as with normal full cost systems. There is absolutely no reason for any smart lotto player to be a constant loser. The LOTTONET Gold Fx virtually guarantees you to begin winning quickly and consistently on Lotto, Pools or Keno!**

**Don't be just a dreamer, get Lottonet to be a winner.**

### 5 from 6 Guarantee - No Bankers

All system prices calculated on NSW Lotto

System with	Cost to play
10 numbers	\$ 4.15
11 numbers	\$ 7.35
12 numbers	\$ 11.30
13 numbers	\$ 28.80
14 numbers	\$ 45.50
15 numbers	\$ 70.40
16 numbers	\$ 105.60
18 numbers	\$ 212.65
20 numbers	\$ 401.20
22 numbers	\$ 691.90
24 numbers	\$ 1,130.95
26 numbers	\$ 1,778.20
28 numbers	\$ 2,688.00
30 numbers	\$ 3,940.90



Totally unique "Future Draw Evaluator" reveals actual future performance of predicted system.



Unique Dual system scan comparator

Lottonet Gold Fx is the world's largest and the most effective professional Lotto, Keno and Powerball computer program. It offers 960 systems, from 9 to 40 numbers, it has 98 databases and the best ever statistical and prediction software. If you are serious about winning, get your Lottonet Gold now.

**Not quite sure? We'll make it risk free!**

### \$ 2,500 COMPENSATION

will be paid to you if any Lottonet Gold system fails to win at least 1 Division 3 prize, with 5 from 6 computed systems or fails to win First Division, whenever you use 6 from 6 computed systems! (using 1, 2 or 3 bankers)

### 5 from 6 Guarantee - 2 Bankers

System with	Cost to play
12 numbers	\$ 4.65
14 numbers	\$ 9.10
16 numbers	\$ 16.00
18 numbers	\$ 25.60
20 numbers	\$ 38.85
22 numbers	\$ 54.40
24 numbers	\$ 75.80
26 numbers	\$ 181.40
28 numbers	\$ 130.95
30 numbers	\$ 166.85
32 numbers	\$ 208.45
34 numbers	\$ 255.75
36 numbers	\$ 313.10
38 numbers	\$ 373.90
40 numbers	\$ 450.45

**Info: (03) 9770 0788 Order line: 1 800 - 818 898 Fax: (03) 9783 4018**

Name				Address			
Payment	Chq	Money Order	Cash on Delivery	City			
made by:	Master c.	Bank c.	Visa c.				
P/Code				Expiry Date			
Mail to: DIETNER, L.P.O. Box 6001, KARINGAL, VIC 3199							
Sign please							



## MICROSOFT Visual Studio PRO 6.0

Everything you need to quickly build Web and Windows based solutions for your developing world

- Includes: MS Visual Basic 6.0, MS Visual C++ 6.0, MS Visual FoxPro 6.0, MS Visual InterDev 6.0, MS Visual J++ 6.0 & MSDN Library Special Edition
- Develop with HTML, Script & Dynamic HTML to reach any desktop platform (Win 16/32, Mac & UNIX)
- View tables, modify data & create SQL queries within the development environment for any ODBC- or OLE DB-compliant database and much more!

**\$1670**

## MICROSOFT PRESS

Introducing Windows 98	25
Step by Step Windows 98	46
More titles available	Please Call

## MICROSOFT BUNDLES

Windows 98 & Windows 98 Plus Pack	195
-----------------------------------	-----

ACADEMIC PRICING ALSO AVAILABLE PLEASE CALL

## MICROSOFT Visual FoxPro 6.0

Take the quick route to client/server and Internet database solutions for your developing world

- Build high-performance, data-driven Web applications
- Build middle-tier objects that MS Office, MS Visual Studio development system & MS Internet Info Server can easily use
- Automatically manage COM components to scale applications to hundreds of users
- Create libraries of reusable codes & controls, managing them with the Class Browser & Component Gallery



**\$792**

**FREE!**  
**DELIVERY\***  
**TO ALL STATES**

3D Home Architect Deluxe CD ROM	85
ABC Flowcharter 7.0	449
ACT! 4.0	125
ACT! 4.0 & WinFax Pro 8.0	225
Adobe Acrobat 3.0.1	329
Adobe Illustrator 7.0	495
Adobe Pagemaker 6.5 User Licence	795
Adobe PageMill 3.0	159
Adobe Photoshop 4.0 & HP Scanjet 4CSE (Special)	895
Adobe Photoshop 5.0	1,095
Adobe Photoshop 5.0 Upgrade	339
Adobe Premier 5.0	959
Adobe Publishing Collection Windows	1,795
Adobe Publishing Collection & Dextra 4800dpi Scanner	1,895
AutoCAD LT 4.0 Windows 95	695
AutoSketch 5.0 Upgrade	129
Backup Exec 3.0 Win 98	149
Backup Exec 3.0 Win 98 Upgrade	70
Borland Delphi 4.0 Pro	449
Borland JBuilder 2.0 Professional	440

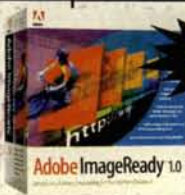
**FAST!**  
**SAME DAY**  
**DISPATCH**

Borland JBuilder 2.0 Standard	165
Carbon Copy 32 V5 for Windows	225
ClickArt 200,000 Classic Image Pack	129
Cold Fusion 3.1 Professional	1,195
Conversions Plus 4.0 Upgrade	112
Corel Draw 8.0 Upgrade	399
Corel Wordperfect Suite 8.0 & Dragon Dictate	245
Crystal Reports Pro 6.0	595
DoubleZIP 97	49
Dragon Dictate Natural Speak Personal	195
Dragon Dictate Natural Speak Preference	325
Drive Image	105
Corel Ventura 8.0	Please Call
Encyclopedia Britannica 98	249
Eudora Pro 4.0	65
Filemaker Developer Edition	860
Filemaker Pro 4.0	279
First Aid 98 DELUXE	89
Freehand 8.0	745
IBM Simply Speaking	75
IBM ViaVoice Gold	239
InstallShield 5.1 Professional	1,240
LightWave 3D 5.6	3,195
Macromedia Director 6.5 Studio	1,750
Macromedia Dreamweaver	525
Macromedia Flash 3.0	529
Macromedia Fireworks	529
Master Clips 202,000 ClipArt Images	115
MAUS MasterPlan Pro (Business Plan)	175
Maximizer 3.0 Special (Upgradable)	29
McAfee Virus Scan 3.0	65

# COMPETITIVE PRICES

MS Access 97 Upgrade/Crossgrade	149
MS BackOffice 4.0 Server	3,547
MS BackOffice Small Business Server & 5 CAL	1,995
MS Encarta 98 Encyclopedia Deluxe	99
MS Excel 97 Upgrade/Crossgrade	149
MS Money 98	45
MS Office 97 Professional Crossgrade	445
MS Office 97 Standard Crossgrade	349
MS Office 97 Value Pack	589
MS Project 98	695
MS Publisher 98	145
MS Visual Basic 6.0 Pro	869
MS Visual C++ 6.0 Standard Upgrade	89
MS Visual C++ 6.0 Pro	860
MS Visual C++ 6.0 Pro Upgrade/Crossgrade	430
MS Visual Basic 6.0 Enterprise Upgrade	1,195
MS Visual Basic 6.0 Pro Upgrade/Crossgrade	429
MS Visual Studio 6.0 Pro Upgrade	869
MS Windows 98	279
MS Windows 98 Upgrade	139
MS Windows 98 Upgrade & WinFax Pro 8.0	199
MS Windows 98 Upgrade Aid	35
MS Windows NT 4.0 Server & 5 Client	1,059
MS Windows NT 4.0 Workstation	419
MS Word 97 / Home Essentials 98	149
MYOB 8.0	349
MYOB Premier Accounting 1.1 3 User	895
Norton PC Anywhere 8.0 32bit	199

## ADOBE ImageReady 1.0



**\$245**

WIN & MAC

**Streamlined image processing  
for the Web professional**

Adobe® ImageReady is the Web professional's powerhouse with everything you need to prepare images and graphics for the Web faster. Real-time image compression, built-in editing tools, easy animation and batch processing help you optimize, animate and more!

- LiveView window:** compare original & optimized versions of an image as you adjust compression settings & view resulting file sizes & download times
- Optimize palette:** interactively adjust compression settings
- Preview Browser Dither command:** save time by previewing browser dithering problems without loading images into a browser & shifting to 8-bit colour mode
- Animation palette:** quickly create animated GIF files with a Tween function that builds frames automatically & more!

**RELIABLE**



Norton Uninstaller Deluxe	49
Norton Utilities 3.0 Gold	105
Nuts & Bolts 98	95
Paintshop Professional 5.0	169
Partition Magic 3.0	107
Quick Payroll 4.0	145
Quick Payroll 4.0 Pro	389
Quick Payroll 4.0 Pro Upgrade	139
Quick Tax 97-98	45

# BUY

## XIRCOM RealPort Ethernet

10/100+Modem 56



\$699

Ex Tax \$594

The first 16-bit integrated PC Card with a built-in connector system has all the features you need to connect to information in the office or on the road, anywhere in the world

# SOFTWARE

# THE

# SMART

# WAY

Quicken 7.0 Deluxe	89
Quicken 7.0 for Windows	69
Quicken 7.0 for Business	139
System Commander Deluxe	145
TypeQuick 7.5 (Win/MAC)	75
Vet Premium	99
WinFax PRO 8.0	119
Procomm Plus 32 4.5	245
<u>Academic Versions (Student/Teacher ID required)</u>	
ED ABC Flowcharter 7.0	179
ED Adobe Illustrator 7.0	215
ED Adobe PageMaker 6.5	339
ED Adobe PageMill 3.0 (Special)	79
ED Adobe Photoshop 5.0 (Win/MAC) - NEW	419
ED Adobe Premiere 5.0	479
ED Adobe Type Basics 3.0.2 SPECIAL	39
ED Borland Delphi 4.0 Pro	169
ED Borland Delphi 4.0 Standard	89
ED Infini-D 4.5	560

ED Kai's Power Tools 3.0 Win 95/NT	135
ED Macromedia Director Studio	1,015
ED Macromedia Dreamweaver	320
<b>ED Microsoft Available</b>	
ED Norton AntiVirus 4.0 GOLD	69
ED Norton Antivirus 50 Licence Pack	189
ED Norton PC Anywhere 32 8.0 H&R	135
ED Norton Utilities 3.0 GOLD	75
ED WinFax Pro 8.0	85

### Peripherals & Hardware:

	Tax:	Ex Tax:
Adobe Photoshop 4.0 & Scan 5100C	659	579
Banksia MyModem 56V External	269	230
Banksia Wave SP56K OutModem	265	224
Canon BJCT000 Colour Inkjet Printer	599	500
Canon CanoScan FB610 Colour A4 Scan	380	317
CD KODAK GOLD Blank 10 Pk (inc case)	35	29
CD Labelling Kit Pressit	145	118
CDR SONY 8x Read, 2x Write IDE Drive	685	561
CD-ROM Mitsubishi IDE Drive x32	120	98
Hayes Accura 56K Ext Data/Fax Modem	235	199
HP Deskjet Color & BW Cartridge 600 Series	45	36
HP ScanJet 4CSE - SPECIAL!	695	580
HP ScanJet 5100C Scanner	479	399
HP ScanJet 6100C	1,269	1,058
Imega Buzz - Video, Capture & Editing	390	319
Jaz Drive 2GB SCSI Internal 3.5	1,070	881
Netcomm Roadster 56 II USB	349	297
Netcomm Roadster Ultra II 56k SVD	260	225
OmniPage Pro 8.0 & HP ScanJet 5100C	669	600
US Robotics Sportster Voice 56K Internal	225	191
Xircom 56k PCMCIA Card Modem - SPECIAL	349	339
Xircom Realport 10/100 & 56k Modem	699	594

## NORTON Mobile Essentials

End your mobile frustrations



\$127

Leave the office with confidence. Norton Mobile Essentials helps you quickly adjust to new work environments so that you can start working immediately upon arrival of a new location. All computer settings will be automatically changed & connection problems will be resolved. Guarantee your productivity, anytime, anywhere - GET YOUR COPY NOW!



Daily updates available at <http://www.citysoftware.com.au>  
Unit 103, Axxess Corporate Park, 45 Gilby Rd. P.O. Box 697,  
Mt. Waverley VIC 3149 Email: [sales@citysoftware.com.au](mailto:sales@citysoftware.com.au)

**Call Now : 1 300 65 8600**

**Local call cost applies. Fax : 03 9558 9900**

**\*FREE Express Freight**

FOR ALL ORDERS OVER \$200 - otherwise add \$10 for delivery (\$5 to Melbourne Metro). Same day delivery for Melbourne Metro (order by 12:30pm) and next day air for most other locations (order by 4pm). Government/corporate purchase orders and credit cards welcome. Further discounts on quantity. Ask our corporate specialists for volume licence pricing. Prices/versions subject to change without notice. Full price list available on request. Savings off RRP/SRP. All prices include sales tax. Only official Australian versions listed. E & O.E



A.C.N. 054615253





**\$SAVE AT LEAST 80%  
AND BE PRINTING  
AGAIN IN NO TIME!\***



\*OUR EASY TO USE INKJET REFILL KITS REDUCE YOUR INKJET PRINTING COSTS BY AT LEAST 80%! WHY BUY ORIGINAL CARTRIDGES?



***When quality is important -***

We use only the highest quality inks and supplies in all our kits to protect the life and performance of your printer, we urge users to beware of inferior refill products which contain unsuitable inks that can cause harm to delicate print heads.



**INTRODUCTORY OFFER!**  
**50% OFF** **CANON, EPSON & HP**  
**PHOTO REFILL KITS**

**SPECIAL ON ALL INKJET REFILL KITS :-**

**BUY ANY**



**AND GET**



**FREE!**

***Yes...we also wholesale! Dealer enquiries welcome!***

**FREE AUSTRALIA WIDE DELIVERY! SAME DAY DISPATCH!!**

**COD \* MONEY ORDER \* CHEQUE \* MASTER \*\*/ISA \* BANKCARD \* AMEX ACCEPTED**



# SUPERIOR INKJET PERFORMANCE REFILLS

OUR INKS ALWAYS PRINT AS GOOD IF NOT BETTER THAN THE ORIGINAL!



## BLACK INKJET REFILL KITS FROM ONLY \$29.90

BLACK KITS INCLUDE SUPERIOR, DENSE & SHARP BLACK INK!!

DESCRIPTION	No. of Fills	Code
CANON BJ-30	60	20-BKL
CANON BJC-70/80	60	21-BKL
CANON BC-01/02/03 BJ-10E/20/BJ-200/BJC-210/210SP/240/255	9	3-BKL
CANON BJ-300/330	7	4-BKL
CANON BJC-600/610/620	16	5-BKL
CANON BJC-4000/4100/4200/4550/5550 BCI-21	45	19-BKL
CANON BJC-4000/4100/4200/4550/5550 BC-20	7	18-BKL
HP Desk Jet 400/500/600C/660C/690C Series	6	8-BKL
HP Desk Jet 850C/855C/870C/1000C Series	6	29-BKL
HP Deskjet 300 Series & Olivetti JP's!	8	7-BKL
EPSON Stylus 400/800/800+/1000	8	1-BKL
EPSON Stylus Colour /PRO/XL	8	2-BKL
EPSON Stylus 820/colour II/IIi	12	23-BKL
EPSON Stylus Colour 200/300/400/500/600/800/1520	12	33-BKL
IBM/LEXMARK 4076/1000/1020/7000	6	35-BKL
CANON, EPSON, HP Fluorescent & Photo Realistic Kits!	12	PLEASE CALL!

**BUY 3  
GET 1 FREE**

## COLOUR INKJET REFILL KITS FROM ONLY \$39.90

COLOUR KITS INCLUDE CYAN, YELLOW & MAGENTA INKS!!

DESCRIPTION	No. of Fills	Code
CANON BJC-70/80	3x30	22-CLR
CANON BJC-210/210SP/240/255	3x12	25-CLR
CANON BJC-600/610/620	3x8	10-CLR
CANON BJC-4000/4100/4200/4550/5550 BCI-21	3x30	17-CLR
HP Colour Desk Jet 300/400/500/600C/660C/690C etc. & Olivetti!	3x12	14-CLR
HP Desk Jet 850C/855C/870C/1000C Series	3x3	30-CLR
EPSON Stylus Colour /PRO/XL	3x4	16-CLR
EPSON Stylus 820/colour II/IIi	3x12	24-CLR
EPSON Stylus Colour 200/300/400/500/600/800/1520	3x12	34-CLR
IBM/LEXMARK 4076/1000/1020/7000	3x6	36-CLR
CANON, EPSON, HP Fluorescent & Photo Realistic Kits!	12/Colour	PLEASE CALL!

New!! Epson Photo 700 & Canon Photo 7000 Kits!



USING NEW REALITY RESOURCES INKJET REFILL KITS WILL **NOT** VOID YOUR PRINTER'S WARRANTY.  
BEWARE OF INFERIOR COPIES, BUY THE "ORIGINAL" REFILL KIT!

The latest colour inkjet printers are precision devices capable of producing photo quality images. All inkjet printers give good results for everyday purposes on plain paper, however, for a perfect image you need to print on a surface that prevents 'bleeding' and retains all of the dyes and ink pigments. 'New Reality Resources' now stock a complete range of the highest quality inkjet media including the new digital camera SUPER GLOSS, which is the best quality available world wide. We also have a great range of the fun stuff..... So call today and we will advise you on how to get the most out of your printer!

**FREECALL OUR FRIENDLY STAFF-**

**1800 680 605**

PH - (07) 3245 2411 FAX - (07) 3245 2755



AUSTRALIAN MANUFACTURERS  
AND PROUD OF IT!



**NEW REALITY RESOURCES PTY. LTD.**

FREECALL - 1800 680 605

PHONE - (07) 3245 2411

FAX - (07) 3245 2755

Bayside Business Park

Shop 1 / 68-72 Redland Bay Rd

Capalaba QLD 4157



SAVE at least 60%  
of print costs with safe,  
clean Inkjet Refills



FREE AUSTRALIA WIDE DELIVERY! SAME DAY DISPATCH!!  
COD \* MONEY ORDER \* CHEQUE \* MASTER \* VISA \* BANKCARD \* AMEX ACCEPTED



# TELEPHONE LINE SHARING '98

## AUSTRALIAN SOLUTIONS ENGINEERED FOR BUSINESSES OF ALL SIZES

**TO SAVE MONEY, IMPROVE YOUR EFFICIENCY, OR ADD  
A PROFESSIONAL TOUCH TO YOUR LINE**

**SHARE YOUR VOICE LINE  
AND SAVE MONEY**

Choose EASY-CONNECT Plus for no compromise Fax reception on any Voice line.

### VOICE - FAX LINE SHARER

Integrate Any Fax (or Modem) into any Telephone Line using your existing number and/or a 2nd FaxStream Duet number. Completely Automatic and Transparent operation, without Compromise. No special wiring, any device at any location. Your Callers will never know it's on the Line.



Choose EASY-CONNECT Pro for no compromise Fax and Modem reception on any Voice line.

### VOICE - FAX - MODEM

Automatic Voice, Fax and Modem operation all on one line, using 1, 2 or 3 separate numbers. Scanning facility will allow your Fax to be used as a Scanner for your PC. Operates with your existing number and/or a FaxStream Duet number or EasyCall Multiple Number.



Choose AUTO-CONNECT when a Fax, Modem or EFT-POS unit needs to be connected to a Commander/PABX Line.

### COMMANDER/PABX LINE

This low cost unit provides automatic connection of your Fax, Modem or EFT-POS device to the telephone line, as soon as it dials. The Commander/PABX is then locked out. Similarly the Fax, Modem or EFT-POS device is locked out whenever the Commander/PABX line is in use.



## OTHER PRODUCTS

### HIGH QUALITY INTERCOM

Interphone provides LOUD, CLEAR, telephone quality communication between any two ordinary telephones, which can be up to several kilometres apart. Simply lift the phone to ring the other. Operation is bi-directional. Ideal intercom for sheds or any remote location.



## START HERE

### IMPROVE YOUR EFFICIENCY OR PROFESSIONALISM

#### TELEPHONE CALL TRANSFER

Now you can answer a call on any telephone and then transfer the call to another telephone fitted to the same line, using your existing telephones. You can even use your phones as an intercom. No special wiring required. Up to 8 extensions per line.



#### MUSIC OR MESSAGE ON HOLD FACILITY FOR ANY LINE

No longer is this important business facility restricted to Commander or PABX systems. Simply connect any radio, cassette, digital player, or even your PC to this low cost unit and add a professional touch to any existing line.



#### DOOR STATION FOR YOUR LINE

When a visitor presses a supplied intercom mounted at your front door or gate, your telephones will ring allowing you to answer and converse from any phone. If your line is in use, a 'Call Interrupt' facility will alert you. You can even open the gate or door with a command from your telephone.



#### REMOTE TELEPHONE ACTIVATOR

The new RTA will allow you to call in on your telephone line and SWITCH ON, SWITCH OFF, or RESET one or two separate electrical appliances simply by ringing your telephone line and using a touch tone telephone. Can be set to only answer a separate FaxStream Duet or Multiple Number.



#### TELEPHONE LINE SIMULATOR

This compact low cost unit allows two telephone devices to ring each other and communicate without the need to connect to a Telecom line. Save 25c per call. Ideal for Testing, Training & Demonstration of all telephone devices. Generates dial tone, busy tone, Calling Number Display and all 8 ring patterns.



**SHARE YOUR FAX or  
MODEM LINE AND SAVE  
MONEY**

Choose AUTO-CONNECT when you wish to fit a Modem or EFT-POS unit to your Fax line, to make outgoing calls.

### OUTGOING MODEM or EFT-POS

This low cost unit provides automatic connection to the telephone line on dialing. Other device is then locked out. Ideal for connection of Payphones, Modems and EFT-POS to any Fax, Commander, PABX or any type of Telephone line. Will also allow both a Fax and Fax/Modem to send and receive Faxes on your Fax line.



Choose FMX-Pro when you wish to fit a Modem to your Fax line and the Modem also needs to receive data calls.

### AUTO MODEM RECEPTION

Now you can connect your Modem to your Fax Line for fully automatic Bi-Directional operation. Directs Fax calls to your Fax and Data calls to Modem. Barge-In protection is provided to prevent one device crashing in on the other while it is in use. Scanning facility will allow your Fax to be used as a Scanner for your PC.



Choose AUTO-SELECT when two or more Modems need to be connected to a Fax line or dedicated Modem line.

### MULTIPLE MODEMS

The Auto Select devices will allow up to eight Modems to be fitted to ONE LINE, or seven Modems and one Fax on the same line. Incoming calls can be automatically routed to any of the 8 separate devices. Barge-in protection is provided to ensure that only one device can have access to the line at any one time.



## OTHER PRODUCTS

### TWO LINE SELECTOR

Now you can connect Two telephone lines (Telstra, Optus, PABX, ISDN or Tie Line) to one Fax, Modem, Cordless Telephone, Answering Machine or any Telephone device. Receive incoming calls from either line. Make outgoing calls on either line.



Manufactured  
in Australia

• SUPPLIED WITH ALL NECESSARY CABLES AND ADAPTORS • DEALER ENQUIRIES WELCOME •  
• 30 DAY MONEY BACK GUARANTEE • TWO YEAR WARRANTY •



#### NSW Distributors:

SYDNEY	(02) 9905 6670
NEWCASTLE	(02) 4962 1313
WOLLONGONG	(02) 4226 2377
TAREE	(02) 6551 2133
PORT MACQUARIE	(02) 6581 1011
COFFS HARBOUR	(02) 6651 6355
LISMORE	(02) 6625 1004

#### QLD Distributors:

BRISBANE/GOLD COAST	(07) 5596 5128
SUNSHINE COAST	(07) 5496 2959
TOOWOOMBA	(07) 4630 1555
OTHER AREAS	(07) 5596 5128

ACT  
VIC  
TAS  
SA  
WA  
NZ

(02) 6285 3899  
(03) 9887 6200  
(03) 6424 3535  
(08) 8362 6776  
(08) 9317 1448  
(09) 309 4744

email: [natcomm@natcomm.com.au](mailto:natcomm@natcomm.com.au)

website: [www.natcomm.com.au](http://www.natcomm.com.au)



# The First ACPI Mainboard From ASUS

ASUS P2B-E consumes only less than  watts, while others  watts, average in suspend mode.

**NO.1**  
Suspend-to-RAM

ASUS P2B-E only takes 8 seconds average, while others 40 seconds, to resume your original operation.



## P2B-E Features Highlight:

- \* Full ACPI 1.0 Power Management Support
- \* Suspend-to-RAM & Suspend-to-Disk ready
- \* 440BX 100MHz Mainboard for Pentium® II Processor
- \* Anti Boot Virus BIOS
- \* Wake-On-LAN, Keyboard Power On, SB-Link™

## P2B-E Benefits You by the Advanced ACPI Power Management Technology

System State (Suspend Mode)	Data Lost	System Power Consumption	Instant Recovery
S0 Working	No	83 Watts	..
S1 Stop Clock	Yes	36 Watts	5 Seconds
S2 CPU Power Off	Yes	35 Watts	5 Seconds
S3 Suspend-to-RAM	No	2.3 Watts	8 Seconds
S4 Suspend-to-Disk	No	2 Watts	40 Seconds
S5 Soft Off	Yes	1.75 Watts	..

(\* Note)

★★★★★★★★★ **100MHz Mainboard Series Available!** ★★★★★★★★★★

### P2B



- \* 440BX 100MHz Mainboard for Pentium II Processor
- \* Anti Boot Virus BIOS, Wake-On-LAN, Keyboard Power On, SB-Link



PC PRO  
AWARD FOR SPEED  
UK, 1/1998



PC LINE  
Highly 4 1/2 Stars Rating  
Japan, 5/1998



PC World  
Editor's Recommended Award  
Japan, 5/1998



DOXY  
Editor's Recommended Award  
Japan, 5/1998



BUNPC  
Editor's Choice  
Taiwan, 5/1998



E3  
Excellent Performance  
Germany, 6/1998

### P2B-LS

- \* Adaptec® 80MB/s Ultra2 SCSI AIC7890 & AIC3860 Onboard
- \* Intel® 82558 10/100Mbps Fast Ethernet Controller Onboard

### P2B-DS

- \* Dual Slot 1 for Dual Pentium II Processors
- \* Adaptec 80MB/s Ultra2 SCSI AIC7890 & AIC3860 Onboard



### PSA-B



- \* Socket 7 100MHz Platform
- \* ALI® Aladdin V AGPset Supports 100MHz System Bus
- \* Supports Pentium, AMD K5/K6/K6-2 & Cyrix M1/M2 Processors
- \* ISA Audio Onboard (optional)
- \* PC Health Monitoring
- \* ACPI & Anti Boot Virus BIOS
- \* Supports Wake-On-LAN, Keyboard Power On & Fast IR
- \* Baby AT Form Factor

### PSA

- \* Socket 7 100MHz Platform
- \* ALI Aladdin V AGPset Supports 100MHz System Bus
- \* PCI 3D Audio Onboard for PC98 logo (optional)
- \* ATX Form Factor



**ASUSTeK COMPUTER INC.**  
150 Li-Te Road, Peitou, Taipei, Taiwan, R.O.C.  
TEL: 886-2-2894-3447 FAX: 886-2-2894-3449  
<http://www.asus.com.tw/>

### DMA

**Direct Memory Access**  
5 Carbon Court, Osborne Park, WA 6017  
TEL: 08-9445-9500 FAX: 08-9445-9504  
<http://www.dma.net.au/>



(\* Note) The estimated data mentioned above are driven under the following configuration: Pentium II 300MHz CPU, ASUS 64MB SDRAM with SIEMENS chips (HYB39516800A1-8), Seagate ST32122A 2GB HDD, ASUS AGP-V264GT3, High Power HPC-250G1 (Rev. A0-01), Running Windows GDI Demonstration Application.



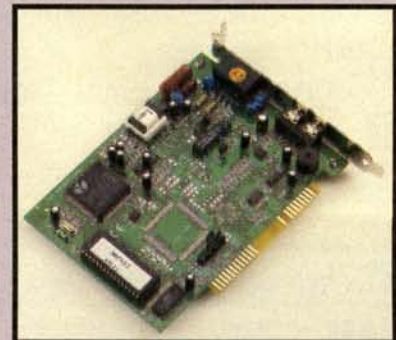
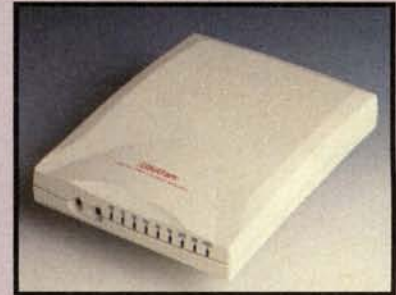
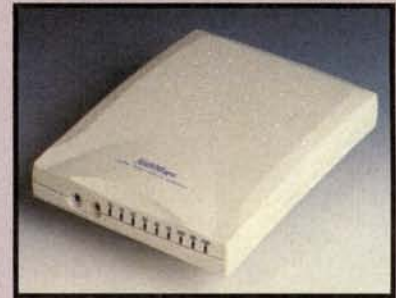
# EXTERNAL & INTERNAL Voice/Data Fax Modem

## INTRODUCING THE

# *SUPERFAST* 56K/33.6K bps

### Specifications

- Physical.** ISA and external
- Data.** 56Kbps capable download speed from Internet Service Providers supporting K56 Flex & V.90. 33,600bps - V.34, 14,400bps - V.32bis, 9600bps - V.32, V.22bis, V.22, V.21
- Error - correction.** MNP 2 -4
- Data compression.** MNP 5, V.42bis
- Facsimile.** 14,400bps - V.17, 9600/7200bps - V.29, 4800bps - V.27ter, 300bps - V.21, Group 3, Class 1 (EIS, TIA 578)
- Simultaneous Audio / Voice and Data.** ITU -T V.61 - 4800bps + audio, ML 144 - up to 9600bps + audio, ML 288 - up to 14,000bps + audio.
- Voice/Audio mode.**
- Enhanced ADPCM Compression / Decompression
  - Tone Detection / Generation and Call Discrimination
  - Concurrent DTMF detection
  - 8 - bit monophonic audio data encoding at 11,000Hz or 7200 Hz
- Full - duplex speakerphone (optional).**
- Acoustic and line echo cancellation
  - Microphone gain and muting
  - Speaker volume control and muting
- International Features.**
- Download speeds 80% faster than 28.8K models
  - Windows 98 compatible
  - Features full plug and play capability (optional)
  - International language manual and software versions available
  - Windows 95 N.T. 4.0 compatible



Visit our WEB SITE [www.dma.net.au](http://www.dma.net.au)

Available throughout:  
AUSTRALIA, NEW ZEALAND, UK, USA,  
JAPAN, KOREA, MALAYSIA, EUROPE

*Dealers welcome*



Rev - 1.0 WARNING  
For safety reasons only connect Austel  
Approved/Austel Permit exempted  
Microphone to the MIC port.  
For safety reasons only connect Austel  
Approved telephone to the phone port.

## Direct Com

*Simply Better*

Direct Memory Access Pty Ltd.

5 CARBON COURT, OSBORNE PARK, 6017. WESTERN AUSTRALIA.

PHONE 08 9445 9500 FAX 08 9445 9504 & 08 9445 9507



# Strictly High Performance

**Free Scala MM200\*  
worth \$399 with every  
Workstation!**

## Pentium II 266MHz NT Workstation

- Pentium II 266MHz CPU
- LX AGP Chipset Motherboard
- 64Mb SDRAM
- 4.3Gb UDMA Hard Drive
- Diamond Viper 330 4Mb AGP
- 32x Sony CD ROM Drive
- Sony 1.44 Floppy Drive
- Soundblaster 16 PnP
- ATX Mid-Tower Macase
- Sony 100ES Monitor
- Windows NT 4.0 Workstation
- Honeywell Enhanced Keyboard
- Microsoft Mouse
- Free Scala MM200 worth \$399!
- Rackmount option available

**\$2895**

## Pentium II 333MHz NT Workstation

- Pentium II 333MHz CPU
- LX AGP Chipset motherboard
- 128Mb SDRAM
- 4.3Gb UDMA Hard Drive
- Diamond FireGL 1000 Pro 8Mb
- 32x Sony CD ROM Drive
- Sony 1.44 Floppy Drive
- Soundblaster 16 PnP
- ATX Mid Tower Macase
- Sony 100ES Monitor
- Windows NT 4.0 Workstation
- Honeywell Enhanced Keyboard
- Microsoft Mouse
- Free Scala MM200 worth \$399!
- Rackmount option available

**\$3895**

## Pentium II 400MHz NT Workstation

- Pentium II 400MHz CPU
- BX AGP Chipset motherboard
- 100MHz bus speed
- 64Mb 100MHz Cert SDRAM
- 9.1Gb 7200 rpm UDMA Hard Drive
- Diamond Fire GL 1000 Pro 8Mb
- 32x Sony CD ROM Drive
- Sony 1.44 Floppy Drive
- Soundblaster 16 PnP
- ATX Mid Tower Case
- Sony 200ES 17" monitor
- Windows NT Workstation
- Honeywell Enhanced Keyboard
- Microsoft Mouse

**\$5295**

## Dual Pentium II 400MHz NT Workstation

- Dual Pentium II 400MHz CPU
- BX AGP Chipset motherboard
- 100MHz bus speed
- 128Mb 100MHz Cert SDRAM
- 9.1Gb 7200 rpm UDMA Hard Drive
- Diamond Fire GL 1000 Pro 8Mb
- 32x Sony CD ROM Drive
- Sony 1.44 Floppy Drive
- Soundblaster 16 PnP
- ATX Full Tower Case
- Sony 200ES 17" monitor
- Windows NT Workstation
- Honeywell Enhanced Keyboard
- Microsoft Mouse

**\$7559**

**SCALA**<sup>®</sup>  
COMPUTER TELEVISION

**adaptec**

**DIAMOND**  
MULTIMEDIA

**SONY**<sup>®</sup>

**Online Quotes 24hrs 7 days - check out our *AutoQuote*  
and full product range at [www.sigma.com.au](http://www.sigma.com.au)**

**DPS**  
**SPARK**  
*Plus*

The DPS Spark Firewire editing card offers Digital Video input/output (IEEE1394 Firewire).

DPS Spark with Premiere 5.0 ..... \$1695  
DPS Spark Plus with SCSI, Premiere 5.0 ..... \$1909

**Free  
Scala MM200\*  
worth \$399!**

**Cinemaster  
DVD Card**

The Cinemaster DVD card is now available. Featuring Dolby AC3 surround sound and video inlay this is the ultimate DVD/MPEG-2 decoder card.

Cinemaster Card only ..... \$269  
Cinemaster with DVD CD ROM Drive ..... \$619

**DVD**  
**ROM**<sup>™</sup>

**DOLBY AC-3**  
DIGITAL AUDIO

**LIGHTWAVE 3D**



The professional standard in 3D graphics rendering software just got better, as used on TV shows including SeaQuest DSV, Babylon 5, Robocop and Star Trek. No other 3D software combines this level of power and flexibility with such an easy-to-use interface. Version 5.5 has incredible new features including multi-threaded rendering, an improved user interface and Morph Gizmo for character animation. MMX and Direct3D are now supported, plus much more! Call now to arrange a demo.

*All PCs have 3 year parts & labour warranty. Call for a quote on your required configuration.*

*We only sell performance systems*

*Intel Pentium II 233-based Workstation is our minimum configuration.*

*\*OEM version without manual*



**SIGMACOM PTY LTD**

Suite 16 / 20-24 Gibbs St ACN 065 279 101  
Miranda NSW 2228 Tel (02) 9524 9846  
[www.sigma.com.au](http://www.sigma.com.au) Fax (02) 9540 4554



# Dragon NaturallySpeaking



Now  
You're  
Talking!

**TRUE CONTINUOUS SPEECH. SPEAK TO YOUR  
COMPUTER NATURALLY, YOUR WORDS SWIFTLY  
APPEARING ON YOUR COMPUTER SCREEN!**

## Speaking is the Natural Alternative

It's simple. Just speak to your computer naturally - without pausing between words - and watch as sentences appear on your screen. Dictate entire paragraphs at a time. Compose e-mail messages, create reports, draft letters, and edit proposals just by speaking. You'll find Dragon NaturallySpeaking can be faster and more natural than typing.

## Suited for Everyone

Dragon NaturallySpeaking is the natural way to input text.

**Business Executives** and all their staff quickly create e-mail and confidential correspondence from start to finish, without relying on others.

**Lawyers** reduce turnaround time and support costs by eliminating the "dictate-transcribe-revise-approve" cycle.



**Doctors** instantly create accurate and legible records without transcription costs, errors and delays.

**Designers** keep their eyes and concentration on their work as they enter commands without lifting their hands off the system mouse.

**Writers, Programmers, and other** keyboard-intensive users reduce the risk of injury from repetitive keyboard and mouse actions.



## Highly Accurate

Dragon NaturallySpeaking is the most accurate general purpose dictation product ever produced by Dragon Systems. With regular use, 95% accuracy can be achieved. Dialects, accents and individual pronunciations are learned quickly and automatically.

## Large Vocabulary

All of the words most people use everyday are immediately recognized. The 30,000 word active vocabulary contains words and names that cover a wide range of subjects. Less common words can be quickly retrieved from the 200,000+ word back-up dictionary. New words can be added simply by saying them and spelling them once or by using the Vocabulary Builder tool.

## System Requirements

Minimum 133MHz Pentium Processor IBM Compatible PC with 32MB RAM (Faster with MMX)

**DragonDictate Australia Wide Sales and Support**

Voice Systems

Email: [sales@dragondictate.com.au](mailto:sales@dragondictate.com.au)

<http://www.dragondictate.com.au>

L3/456 St Kilda Road  
Melbourne Vic. 3004

**Tel: 03 9866 5733**

Fax: 03 9820 1872

L3/379 Pitt Street  
Sydney NSW 2000

**Tel: 02 9264 4055**

Fax: 02 9264 4115

L12/141 Queen Street  
Brisbane Qld. 4000

**Tel: 07 3236 5944**

Fax: 07 3236 5988

L4/45 King William Street  
Adelaide SA 5000

**Tel: 08 8212 2662**

Fax: 08 8212 2882



# 7 Take Seven Computers

*Technology Distribution for*

## LEADING BRANDS

**COMPAQ**



- \* PCs
- \* Workstations
- \* Servers
- \* Notebooks
- \* Networking Products

**Canon**

DIGITAL  
COLOUR



- \* Inkjet printers
- \* Laserjet printers
- \* Scanners
- \* Digital Cameras
- \* Consumerables

**When you  
need quality  
products, think  
about us...who  
drive your  
dollar further,  
while giving  
you more  
comfort**

**hp HEWLETT  
PACKARD**



- \* PCs
- \* Notebooks
- \* Servers
- \* Printers
- \* Commercial printers
- \* Consumerables
- \* Network products
- \* Storage Devices

**TOSHIBA**

- \* High quality Notebooks



For Information:

**SYDNEY**

817 Princes Highway  
Tempe, NSW 2044

**Tel: (02) 9558 9288**

Fax: (02) 9558 9388

**BRISBANE**

**Tel: (07) 3857 5969**

Fax: (07) 3857 5419

Enter the draw for this **Great Prize...**

**Canon Multipass-C30 Colour Printer / Fax / Copier / Scanner that is worth \$1199**

You can enter the draw to win this fabulous 4-in-1 office machine by just filling out all your details and complete this survey below and send it back by fax (02) 9558 9388 or post to:

*Market Research Department, Take Seven Computers,  
817 Princess Highway, Tempe NSW 2044*

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Tel: \_\_\_\_\_ Fax: \_\_\_\_\_ email: \_\_\_\_\_

1. What printers are used in your workplace? ☐ Inkjet ☐ Laserjet ☐ Other

2. How many computers are networked in your workplace? ☐ None ☐ 2-20 ☐ 20+

3. Are you satisfied with the PCs you are using? ☐ Need to be upgraded ☐ O.K. ☐ Good

4. How often do you use notebooks? ☐ Never ☐ Sometimes ☐ Frequently

Entries will be drawn at the Sydney office on December 8, 1998. Winners will be notified by fax/email/post.

Results will be published in the coming issue. NFP ☐





# AUSTRALIAN CORPORATE TECHNOLOGY

HEWLETT-PACKARD PC's LAPTOPS PRINTERS SCANNERS PLOTTERS CD-WRITERS

## HP ScanJet Scanners

HP ScanJet 5100C	\$372 ex \$442 inc
HP ScanJet 6100C	\$969 ex \$1,152 inc
HP Photo Scanner	\$672 ex \$799 inc
Add PhotoShop v4.0	\$170
Add OmniPage Pro v8.0	\$190

**SAVE 20%**  
WITH OUR CONSISTENTLY  
**LOW PRICES**

**hp** HEWLETT®  
PACKARD  
Registered Reseller



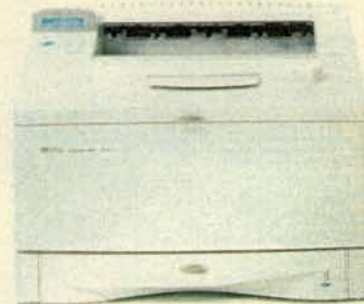
## HP DeskJet Printers

HP DeskJet 340	\$379 ex \$450 inc	<b>Multifunction Units</b>	
HP DeskJet 670C	\$196 ex \$232 inc	<b>Print-Scan-Copy-Fax</b>	
HP DeskJet 692C	\$314 ex \$373 inc	HP OfficeJet 590	\$609 ex \$724 inc
HP DeskJet 720C	\$403 ex \$479 inc	HP OfficeJet 635	\$762 ex \$906 inc
HP DeskJet 890C	\$625 ex \$743 inc	HP OfficeJet 1170C	\$1,126 ex \$1,338 inc
HP DeskJet 1120C	\$703 ex \$836 inc	HP OfficeJet 1175C	\$1,428 ex \$1,697 inc

## HP LaserJet Printers

HP LaserJet 6L	\$536 ex \$637 inc
HP LaserJet 6P	\$1,110 ex \$1,319 inc
HP LaserJet 6MP	\$1,322 ex \$1,571 inc
HP LaserJet 4000	\$1,798 ex \$2,137 inc
HP LaserJet 4000N	\$2,247 ex \$2,671 inc
HP LaserJet 5000	\$2,424 ex \$2,881 inc
HP LaserJet 8000	\$3,785 ex \$4,499 inc

**HP LASERJET 3100**  
**PRINT-FAX-COPY-SCAN**  
**\$1119 ex \$1330 inc**



## HP Vectra & HP Brio Computers

HP Brio 8334 PII266, 4Gb HD, 32Mb RAM, CD & Sound, Win 95	\$1,600 ex \$1,902 inc
HP Brio 8338 PII300, 4Gb HD, 32Mb RAM, CD & Sound, Win 95	\$2,029 ex \$2,412 inc
HP Brio 15" 1024 Low Emmission Monitor VGA Monitor	\$377 ex \$448 inc
HP Ultra VGA 1024 15" Crystal Clear Display	\$424 ex \$504 inc
HP 70 Colour 17" Display	\$850 ex \$1,010 inc
HP 620LX 256 Colour Palmtop, 16Mb & Windows CE Included	\$1,157 ex \$1,375 inc
HP SureStore 7200i Internal CD Re-Writer & 7 Software Packages	\$610 ex \$725 inc

\*Full range of HP PC's, Workstations & Servers Available\*

Please inquire about Hewlett-Packard products not listed. Prices are subject to change without notice

Customer Name	Qty	Description	Price	Total
Phone Number				
Organisation Name				
For Delivery To				
Please charge to				
Expiry				
Delivery in Melbourne & Sydney Metro \$10			Delivery	
Other metro areas \$30, rural areas \$50.			Total	

**98 Elizabeth St, Richmond VIC 3121**  
**Hours: 9-5 Weekdays, 9-1 Saturday**

**Ph (03) 9428 8895**  
**Fx (03) 9428 8440**





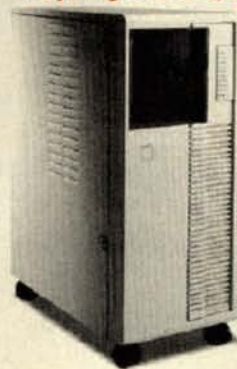
# Intelligent Printing Systems Pty Ltd

Shop 2, 66 Clark Road, North Sydney NSW 2060, Phone (02) 9923 1777 Fax (02) 9923 2226

## Custom built Systems for the new Millennium

### Power Server

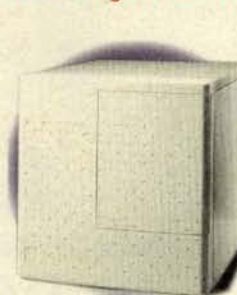
Everything on board, 6xPCI slots FREE



Intel 400MHz Pentium II  
Tyan USA, BX System Board  
Dual Processor Capable  
1 x AGP, 6 x PCI, 1 x ISA Slots  
Server Case with 400W Power Supply  
128MB ECC 100MHz SDRAM  
Adaptec Dual 7895 UW Controller  
RAID option with ARO-1130CA  
9.1GB IBM Ultra Wide SCSI HDD  
AGP 3D Video Card 2MB  
14" Samsung digital Monitor  
Intel EtherExpress Pro/100 NIC  
Creative Vibra 16VX sound chip  
32x CD-ROM, Sony 3.5" Floppy  
Keyboard & Mouse  
56K Flex SVD Modem  
Intel LANdesk Server Manager  
Microsoft Small Business Server 4.0  
1 Year Australia Wide On Site Warranty  
**\$ 8990** or \$69 per week\*

### Small Business Server

Low Voltage Ultra/2 Wide SCSI up to 80Mb Transfer Rate



Intel 400MHz Pentium II  
Tyan USA, BX System Board  
Dual Processor capable  
1 x AGP, 5 x PCI, 2 x ISA Slots  
SBS Case with 300W Power Supply  
64MB ECC 100MHz SDRAM  
UltraSCSI80 Ultra2/Wide Solution  
4.5GB LVD Ultra2/Wide SCSI HDD  
AGP 3D Video Card 2MB  
14" Samsung digital Monitor  
PCI Fast Ethernet 10/100 NIC  
32x CD-ROM, Sony 3.5" Floppy  
Keyboard & Mouse  
Intel LANdesk Server Manager  
MS Windows NT 4.0 Server + 5 CAL  
1 Year Australia Wide On Site Warranty  
**\$ 6850** or \$53 per week\*

Internet Shopping made easy

**www.ipspty.com.au**

**H**igh performance is always a priority for today's computer users. When it comes to the ultimate in power, performance and reliability, IPS towers over the competition. We need to be selective to maintain superior quality and that's why we choose only the best. With names like Tyan, Promise, IBM etc. you can be sure that at IPS we build confidence into every system we sell. When your livelihood depends on cutting-edge technology, cutting corners really doesn't make sense. IPS delivers exceptional performance that you can depend on. Isn't it time to bring an IPS system to your business?



**100MHz  
BX**  
It's [Here]

### Video Raid System

Ideal for Video Capture & Editing



Intel 350MHz Pentium II  
Tyan USA, BX System Board  
1 x AGP, 5 x PCI, 2 x ISA Slots  
Super Midi Case, 250W  
64MB 100MHz SDRAM  
RAID 0/1 Solution  
2 x 4.3GB Ultra ATA H/Drives  
AGP 3D Graphics Accelerator 8MB  
17" Mitsubishi 0.25dp Monitor  
32x CD-ROM, Sony 3.5" Floppy  
Keyboard & Mouse  
PCI 128-3D Soundcard  
360W Subwoofer Speakers  
Microsoft Windows98  
1 Year Australia Wide On-Site Warranty  
**\$ 4490** or \$42 per week\*

### Corporate Workstation

Network Ready



Intel 266MHz Pentium II  
Tyan USA, BX System Board  
1 x AGP, 5 x PCI, 2 x ISA Slots  
Super Midi Case, 250W  
32MB SDRAM  
4.3GB Ultra ATA Hard Drive  
AGP 3D Graphics Accelerator 4MB  
15" Philips digital Monitor  
PCI NE2000 Ethernet Card  
32x CD-ROM, Sony 3.5" Floppy  
Keyboard & Mouse  
Microsoft Windows98  
1 Year Australia Wide On Site Warranty  
**\$ 2290** or \$21 per week\*



3 Years Manufactures Warranty

Pricing includes sales tax. We ship Australia-wide. E & O exempt. The brand and product names are trademarks of their respective companies. Pricing based on cash. A handling charge of 2% for credit card purchases applies.



# SEPTEMBER 1998 - SPECIAL OFFERS

## THE VALUE PACK IS BACK



### New Version for 1998 includes:

- MS Office Pro 97 Upgrade/Tradeup
- Norton AntiVirus V4
- MS Publisher 98 CD
- MS Money 98
- MS Greetings Workshop Deluxe
- MS Encarta World Atlas 98
- IE Explorer 4 & Outlook 98 voucher

**\$589**

## NEW Windows VERSION

- Windows 98
- Full \$285
- Upgrade \$149
- Resource Kit \$109
- MS Plus! 98 \$64

Try our  
**ONLINE SHOPPING EXPERIENCE**  
[www.corpsoft.com.au](http://www.corpsoft.com.au)  
Check for latest pricing & Special Offers

## BEST SELLERS !!



## Microsoft Office 97

- Office 97 Std - New Install\* \$439
- Office 97 Std - Upgrade \$379
- Office 97 Pro - New Install\* \$539
- Office 97 Pro - Upgrade \$479

### MOLP / LICENCES

- Office 97 Std - New Install \$435
- Office 97 Pro - New Install \$535
- Office 97 Pro - Upgrade \$425

\* Upgrade bundle with competitive product - limited stocks

# CORPORATE SOFTWARE AUSTRALIA

Proprietary Limited ACN 003 338 029

UNIT 1 • 28 VICTORIA ST • SMITHFIELD • NSW • 2164

P.O. BOX 6168 • WETHERILL PARK • NSW • 2164

PHONE: (02) 9725-3700 FAX: (02) 9604-1983

OR VISIT OUR WEB SITE: [CORPSOFT.COM.AU](http://CORPSOFT.COM.AU)

WHY PAY MORE? WE GUARANTEE TO BEAT ANY GENUINE COMPETITOR'S PRICE !!

APCPCU/PCW 0998 (0731)

## New for Windows 95 & NT



**Adobe Photoshop V5**  
**\$795**  
Upgrade \$349



**Microsoft FrontPage 98**  
**\$159.00**  
Upgrades for \$84



**Corel WordPerfect 8**  
+ Dragon Naturally Speaking  
Upgrade **\$229**  
Full **\$399**



**AutoSketch V5**  
**\$165**



**WinZip V6.3**  
**\$65**  
10 User Pack \$450

- ABC Flowchart V7 - Licence \$310
- ABC Flowchart V7 (+Free V4) \$350
- ACT V4 for Win95/NT \$145
- Adobe Acrobat V3.0.1 - NEW! \$320**
- Adobe Illustrator V7 - Full \$475
- Adobe PageMaker 6.5 \$795
- Adobe PageMill V3 \$169

### Adobe Photoshop V4 with FREE HP5100C Colour Scanner \$650

- Adobe Photoshop V5 \$795
- Adobe Publishing Collection \$1795
- ArcServe 6.5 - for NT Server \$740
- AutoCAD LT 97 - NEW !!! \$699**
- AutoCAD LT 97 - Upgrade \$365
- Borland C++ Builder V3 Std \$152
- Borland C++ Builder V3 Pro \$489
- Borland C++ Develop. Suite \$429
- Borland Delphi V4 Professional \$595
- Borland J Builder Professional \$450
- Cleansweep V3 - SPECIAL! \$25
- Cleansweep Extra Strength V4 \$85
- Corel Draw V8 - Upgrade \$409
- Corel Draw V8 - Special \$599
- Corel Ventura V8 - Full \$599**
- Corel Ventura V8 - Upgrade \$399**
- Corel WordPerfect Suite V8 \$299**
- Corel WordPerfect Suite V8 Upg \$199
- Corel W/Perf V8 + Dragon \$399**
- Corel W/Perf V8 + Dragon Upg \$229



**Dragon Naturally Speaking Preferred**  
(Inc Free microphone)  
**\$289**

- Dragon Nat/Speak. Preferred \$289
- Drive Image - NEW V2.0 \$125
- Easy CD Creator Deluxe \$154
- Eudora Pro -Email V4 \$75
- Encyclopaedia Britannica 98 \$249
- FileMaker Pro V4 95/NT \$285
- IBM Simply Speaking \$69
- IBM ViaVoice Gold \$249
- Laplink Tech - NEW \$265**
- Laplink for Win95/NT \$175
- Lotus SmartSuite 97 \$320
- Lotus SmartSuite Millennium Ed \$399**
- McAfee VirusScan (Win3/95/NT) \$63
- MS Collection 98 - NEW \$69**  
(Includes Money 98/Encarta Atlas/Greetings Workshop)
- MS Exchange Server + 5 CALs \$1529
- MS FrontPage 98 \$159



**ABC FLOWCHARTER**  
V7 for Win95/WinNT  
Includes FREE ABC Flowchart V4  
**\$350.00**

- MS FrontPage 98 Upgrade \$84
- MS IntelliMouse from \$50
- MS Project 98 - NEW! \$729
- MS Publisher 98 - NEW! \$130
- Win NT Server 4 Resource Kit \$250
- Win NT Wkstn 4 Resource Kit \$128
- MS VisualBasic V6 Pro \$815**
- MS VisualBasic V6 Pro Upg \$415**
- MS Visual C++ V6 Pro \$815**
- MS Visual C++ V6 Pro Upg \$415**
- MS Windows 95 Upg CD \$169
- MS Works V4.5 - NEW !!! \$99
- M.Y.O.B. Accounting V8 \$345
- M.Y.O.B. Asset Manager \$249
- M.Y.O.B. First Accounts \$169
- M.Y.O.B. + Payroll V8 \$505
- Norton Uninstaller Deluxe \$50
- OmniPage Pro V8 Up/Cross \$250

- OmniPage Pro V8 - Full \$400
- OS/2 Warp V4 - Upgrade \$165
- PageKeeper V3 for 95/NT \$95**

**PALM Pilot III - NEW!! \$815**  
(3COMs latest Toy stores 150 To-Do Items, 6000 Appointments and More)

- Partition Magic V3 \$105



**PaintShop Pro V5**  
Including FREE Animation Shop  
**\$135**

### STUDIO 400 \$698

- (Video Editing System - NEW Improved Version)
- System Commander Deluxe V4 \$125
- System Commander 98 \$62
- TextBridge Pro '98 \$179
- TypeQuick (for Windows) \$74
- Uninstaller Deluxe - NEW!! \$85
- VET Premium AntiVirus \$97
- VET Net Surfer AntiVirus \$83

- VISIO Professional V5 \$495**
- VISIO Technical V5 \$495**
- VISIO Standard V5 - New! \$225**
- VISIO IntellCAD 98 \$525**

- Xtree Gold Windows V4 \$105



**Microsoft Small Business Server + 5 Clients**  
from **\$1399**

CORPORATE & GOVERNMENT ENQUIRIES WELCOME. FURTHER DISCOUNTS AVAILABLE DEPENDING ON QUANTITY REQUIRED



# SEPTEMBER 1998 – MORE SPECIAL OFFERS



**Microsoft®**  
**Publisher 98**  
**\$130**  
Upgrade \$115

**Microsoft®**  
**IntelliMouse**

1-4 Units **\$60**  
5-9 Units **\$55**  
10+ Units **\$50**



## NEW PRODUCTS FOCUS



**Microsoft®**  
**Windows NT**  
**Server V4**  
**\$995!!**

- Win NT Server 4 Resource Kit \$250
- Win NT Workstation V4.0 Full \$470
- Win NT Workstation Licence (Min Qty) \$395
- Win NT Workstation V4.0 Upgrade \$225
- Win NT Workstation 4 Resource Kit \$128
- Diskeeper V3 for NT Workstation \$99
- Diskeeper V3 for NT Server \$465
- MS Win NT Server 4 + 5 Clients \$1225
- MS Win NT Client Licence 20 Pack \$900

## NEW VERSIONS FOR WIN 95/NT



**Microsoft®**  
**Project 98**  
New version for 95/NT  
**\$729**  
Upgrade for \$299



**Microsoft®**  
**VisualBASIC**  
Professional V5  
**\$455**  
(Save \$310)

*This Special Offer is for owners of MS Office Pro.*

# CORPORATE SOFTWARE AUSTRALIA

UNIT 1 • 28 VICTORIA ST • SMITHFIELD • NSW • 2164  
P.O. BOX 6168 • WETHERILL PARK • NSW • 2164

Proprietary Limited ACN 003 338 029

**PHONE: (02) 9725•3700 FAX: (02) 9604•1983**  
**OR VISIT OUR WEB SITE: CORPSOFT.COM.AU**

**Phone or Fax your Order and we'll Deliver to your Home or Office**

APC/PCU/PCW 0996 (0731)



**SEAGATE BACKUP**

**Price Blitz**

- NT Server **\$625**
- NT Enterprise **\$1375**
- Win 98 Desktop **\$129**



**FREE**  
**Windows 98**  
**Upgrade Licence**

Just order Windows 95 Upgrade Licence for

**\$148!!**

*Minimum quantity required*

## SYMANTEC BESTSELLERS!



**NORTON**  
**ANTIVIRUS**  
**Version 4**  
CD for Win95/NT/3,1  
**\$84.00**



**NORTON**  
**UTILITIES**  
**GOLD - NEW!**  
**\$104.00**  
(Upgrades for \$85)

**PC Anywhere**  
**NEW V8**  
Dos/Win3/Win95/NT  
Incl Host & Remote  
**\$185.00**



**WINFAX**  
V8 FOR WINNT/95  
**\$117.00**  
Upgrades for \$85



## NEW VERSION FOR 98



**CORELDRAW**  
**VERSION 8**  
**SPECIAL OFFER**  
**\$599**  
Upgrade for \$409



**System**  
**Commander**  
**Deluxe**  
**VERSION 4**  
**\$125**



**PARTITION**  
**MAGIC**  
Version 3  
**\$105**

## PLEASE NOTE

- DELIVERY: POST \$10 OR COURIER \$14.
- WE ACCEPT BANKCARD MASTERCARD & VISA
- PHONE, FAX AND MAIL ORDERS WELCOMED
- GOODS ORDERED IN ERROR INCUR A 15% RESTOCKING FEE.
- WE ACCEPT AUTHORISED RETURNS FOR CREDIT WITHIN 10 DAYS IF GOODS ARE UNOPENED AND IN SALEABLE CONDITION.
- PRICES INCLUDE SALES TAX WHERE APPLICABLE
- MONEYBACK OFFERS (IF ANY) ARE THE RESPONSIBILITY OF THE MANUFACTURER, E.& O.E.
- ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

## CORPORATE CLEARANCE SALE

**STOCKS ARE LIMITED. SAVE \$100s!!**  
(FULL COPY - COMPLETE WITH DOCUMENTATION, DISKS, LICENSE AND REGISTRATION)

- CLEANSWEEP V3 \$25
- IBM ANTIVIRUS \$39
- IBM SIMPLY SPEAKING (FREE MIC) \$69
- MAUS MASTERPLAN FOR WINDOWS \$169
- MEDIASTUDIO PRO V5 \$365
- MS INTELLIMOUSE \$60
- MS OFFICE STD V4.2 \$445
- MS PUBLISHER 98 \$125
- MS WORD V6 \$210
- PAGEMAKER V6.5 \$795

*IDEAL FOR CORPORATE & GOVERNMENT BUYERS.*



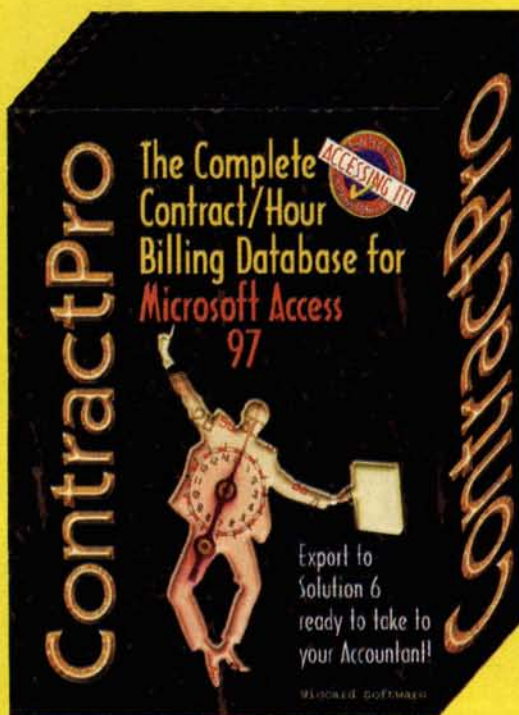


# TIME TO TAKE CHARGE!

*With ContractPro*

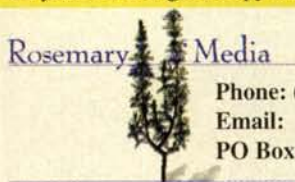
**A Ready to Go Database For Microsoft Office and Access 97 +**

Charge by the Hour? Then ContractPro is the Database solution for you! ContractPro has been specifically designed for business and individuals who charge by the hour. It offers a full range of business features that will save you both time and money. Even if you don't charge by the hour, ContractPro can still help you with it's extensive range of features.



- ◆ Client & Project Management.
- ◆ Time Cards & Invoicing.
- ◆ Project Time & Expense tracking.
- ◆ On the Fly Data Entry.
- ◆ Statements & Account management.
- ◆ Suppliers & Purchases.
- ◆ Running Expenses.
- ◆ Product/Expense information & pricing.
- ◆ Purchasing
- ◆ Purchase & Service Orders.
- ◆ Inventory management.
- ◆ Bank Reconciliation
- ◆ Multi-User
- ◆ Profit/Loss, Accounts Aging, Cash Flow & other essential reports.
- ◆ Export to Solution 6
- ◆ Safe, reliable & easy to use Microsoft Environment.

ContractPro is an easy to use Time Billing database that runs inside of MS Office/Access 97+. This empowers ContractPro with all of the power, compatibility and reliability of the Microsoft Environment. Unlike other accounting and business software available, you do not need to be an accounting genius to setup or use ContractPro. The software is intuitive and easy to use with help tips and online help available during program usage. ContractPro can save you both time and money and can provide the user with upto date information on their business. Even if you don't charge by the hour, ContractPro can be used as a billing, purchasing, expense tracking or quoting system. Make life easier on yourself and get a copy of ContractPro Today!



Phone: (07) 3880 3349 Fax: (07) 3880 0760  
Email: wiccard@one.net.au  
PO Box 362 Redcliffe, QLD 4020

**Available at all good computer stores.**

**An Australian Made Product.**



# The cover disc: apcmag.cd

This disc has two main aims:

- To provide fast, easy access to the files and resources we talk about in *APC* and to save you download time and money;
- To make it easy for our readers to get on the Internet so they can use our new interactive Web site.

The kit contains browsers, file-transfer programs, mail and newsreaders and much more for each of the major operating systems. To make it as easy as possible for readers to get online, we've also included reader offers and a sign-up kit.

**apcmag.cd** aims to complement both the magazine and *APC*'s Web site. The concept is simple: when you read about a program in the magazine, such as a piece of software from a Shareware column, you need only insert **apcmag.cd**, browse it with your favourite WWW browser, and download the file directly from the CD. Articles which include related items on the CD are identified by the ● symbol at the top of the page. Each piece of software includes instructions on whether you will need to unzip the file before installing it; most also include Readme files.

## Using the CD

Everything you need to use **apcmag.cd** has been created in HTML. You don't need any special software to access the disc, other than a

standard browser, and it will work on most common platforms.

We've provided the software on the CD for the convenience of our readers — to save you the effort of locating and downloading around 600M of material yourself.

As with any site on the Web, the software on this CD is provided as is, in the hope that it will

be useful to you, and without any warranty, express or implied. If you're interested in a product or service we review or refer to, contact the company that distributes or supports it for more information, or to discuss any problems you may have with it.

You should carefully read the licensing

agreements and honour any evaluation or shareware terms specified, read all instructions and Readme files, and virus-check every program before use. We check the CD with the latest available tools each month, but new viruses appear every week.

While we've taken every care to ensure that the software provided is useful and that it works, we cannot accept responsibility or liability for any of the products included.



## How to run the CD

### Windows 95 and NT users

This CD uses an Autorun feature for Windows 95 and NT systems. Just insert **apcmag.cd** and your browser will automatically load with the **apcmag.cd** front page.

**Note:** First-time users of the CD will be prompted by a browser set-up program (SETUP32.EXE) which will allow you to install a browser or update your current browser. This program is only loaded once, and subsequent use of the CD will automatically start your installed browser.

### Win 3.x, OS/2, Mac, Linux

Simply launch your favourite browser and load the file DEFAULT.HTM in the root directory of the CD.

If you don't have a browser, run the file INSTALL.BAT in the root directory of the CD.

The CD has been tested using Netscape Navigator 3.0 and 4.0, and MS Internet Explorer 3.0 and 4.0.

## Conditions of entry

Instructions on 'How to Enter' form part of the Conditions of Entry of all competitions in *APC* September. Entry is free and open to all residents of Australia other than employees of ACP Publishing Pty Ltd (ACN 053 273 546), suppliers of competition prizes, their families and associated agencies.

The contests close last month September 20. Enter according to the instructions supplied with the individual competition. The contest will be judged by a panel appointed by ACP Publishing Pty Ltd on September 20, 1998. The judges' decision in relation to any aspect of the competition is final and binding on every person who enters. No correspondence will be entered into. Chance plays no part in determining the winner. No responsibility is accepted for late, lost or misdirected entries. All entries become the property of ACP Publishing Pty Limited, the promoter, 54 Park Street, Sydney, NSW 1028.

The prizes are not transferable or redeemable for cash. Any change in the value of the prizes occurring between the publishing date and the date the prizes are claimed is not the responsibility of the promoter.

Winners will be notified by security post and their names published in the September issue of *APC*.

### Contacting APC

**Sydney Office:**  
Address: PO Box 4088,  
Sydney NSW 1028  
Phone: (02) 9288 9123  
Fax: (02) 9264 6320  
Email: apc@acp.com.au  
**Melbourne Office:**  
Address: 102 Toorak Road,  
South Yarra Vic 3141  
Phone: (03) 9823 6333  
Fax: (03) 9820 1134  
Email is preferred.  
Internet: apc@acp.com.au

### Reader inquiries/back issues

**Contact:** Kim Edwards  
**Phone:** (02) 9288 9123  
**Email:** kedwards@acp.com.au  
Contact for article archives, information regarding topic coverage, and back issue orders. Copies of old issues of *APC* are available at most local libraries, or from *APC*, Attn: Kim Edwards, PO Box 4088, Sydney NSW 1028. We can run out of issues quickly, so please contact Kim Edwards before sending a cheque.

### Workshop/technical queries

**Contact:** Workshop  
**Fax:** (02) 9264 6320  
**Email:** workshop@acp.com.au

Due to the volume of queries we receive, we are unable to help with technical questions over the phone. However, please post, email or fax us your technology experiences, questions, tips and hints.

### Reprints and copyright

**Contact:** Heather Milley  
**Phone:** (02) 9288 9164  
**Email:** hmilley@acp.com.au  
Information on copyright and rates for commercial reprints of articles or reviews used in *APC*.

## Editorial submissions

We welcome readers' letters, ideas for articles or reviews, information on new products and companies, and any insight they can give into the PC industry or the use of technology.

### Article ideas

Please let us know if you have an idea for an article or review you'd like to write, or that you'd like to see us cover in *APC*. We appreciate submissions, but can't guarantee a reply. Please send (preferably by email) a brief résumé with an outline of your experience and interests, and a sample of your writing with an outline of the article you have in mind.

### Press releases

Please send press releases to the address listed at left, via email to [press@acp.com.au](mailto:press@acp.com.au) or to one of the following specific section editors:

<b>News</b>	Angus Kidman <a href="mailto:akidman@acp.com.au">akidman@acp.com.au</a>
<b>First Take</b>	Nathan Taylor <a href="mailto:ntaylor@acp.com.au">ntaylor@acp.com.au</a>
<b>Features</b>	Helen Dancer <a href="mailto:hdancer@acp.com.au">hdancer@acp.com.au</a>
<b>Reviews</b>	Steven Fear <a href="mailto:sfear@acp.com.au">sfear@acp.com.au</a>
<b>Technical Features</b>	Selina Mitchell <a href="mailto:smitchell@acp.com.au">smitchell@acp.com.au</a>
<b>Workshop</b>	Ashton Mills <a href="mailto:amills@acp.com.au">amills@acp.com.au</a>
<b>After Hours</b>	Lindsay Hayman <a href="mailto:lhayman@acp.com.au">lhayman@acp.com.au</a>

Due to the volume of mail we receive, we are unable to confirm receipt of individual press releases. Please feel free to contact us for a copy of our PR Guide and Media Kit.



## COMPANIES INSIDE

Altima Computers

B.I.T.S

Computer Fair/Promotional  
Enterprise

Critical Systems

Data Defender

De Negris Enterprises

Diskmax Technology

Fagan Microsystems

MARK I

Memory World

Multi-Tech Trading

New Reality Resources

Nutters

Open Systems Pty Ltd

Pelham Pty Ltd.

Polygon Systems

Procon Technology

Recojet

Rite Price Computer Wholesale

Spitfire Toner Recharger

Swann Communication

Telset Technologies

Up 'N' Away

# InkJet

Reduce Inkjet Printing

OUR INKS ALWAYS PRINT AS GOOD



# ReFills

Costs by at least 80%

IF NOT BETTER THAN THE ORIGINAL!



## BLACK INKJET REFILL KITS FROM ONLY \$29.90

BLACK KITS INCLUDE SUPERIOR, DENSE & SHARP BLACK INK!!

### DESCRIPTION

CANON BJ-30  
CANON BJC-70/80  
CANON BC-01/02 BJ-10E/20/BJ-200/BJC-210/210SP/240/255  
CANON BJ-300/330  
CANON BJC-600/610/620  
CANON BJC-4000/4100/4200/4550/5550 BCI-21  
CANON BJC-4000/4100/4200/4550/5550 BC-20  
HP Desk Jet 400/500/600C/660C/690C Series  
HP Desk Jet 850C/855C/870C/1000C Series  
HP Deskjet 300 Series & Olivetti JP's!  
EPSON Stylus 400/800/800+/1000  
EPSON Stylus Colour /PRO/XL  
EPSON Stylus 820/colour II/IIi  
EPSON Stylus Colour 200/300/400/500/600/800/1520  
IBM/LEXMARK 4076/1000/1020/7000  
CANON, EPSON, HP Fluorescent & Photo Realistic Kits!

### No. of Refills

60  
60  
9  
7  
16  
45  
7  
6  
6  
8  
8  
12  
12  
6  
12

### Code

20-BKL  
21-BKL  
3-BKL  
4-BKL  
5-BKL  
19-BKL  
18-BKL  
8-BKL  
29-BKL  
7-BKL  
1-BKL  
2-BKL  
23-BKL  
33-BKL  
35-BKL

**BUY 3  
GET 1  
FREE**

PLEASE CALL!

## COLOUR INKJET REFILL KITS FROM ONLY \$39.90

COLOUR KITS INCLUDE CYAN, YELLOW & MAGENTA INKS!!

### DESCRIPTION

CANON BJC-70/80  
CANON BJC-210/210SP/240/255  
CANON BJC-600/610/620  
CANON BJC-4000/4100/4200/4550/5550 BCI-21  
HP Colour Desk Jet 300/400/500/600C/660C/690C etc. & Olivetti!  
HP Desk Jet 850C/855C/870C/1000C Series  
EPSON Stylus Colour /PRO/XL  
EPSON Stylus 820/colour II/IIi  
EPSON Stylus Colour 200/300/400/500/600/800/1520  
IBM/LEXMARK 4076/1000/1020/7000  
CANON, EPSON, HP Fluorescent & Photo Realistic Kits!  
New!! Epson Photo 700 & Canon Photo 7000 Kits!

### No. of Refills

3x30  
3x12  
3x8  
3x30  
3x12  
3x3  
3x4  
3x12  
3x12  
3x6

### Code

22-CLR  
25-CLR  
10-CLR  
17-CLR  
14-CLR  
30-CLR  
16-CLR  
24-CLR  
34-CLR  
36-CLR

12/Colour PLEASE CALL!



USING NEW REALITY RESOURCES INKJET REFILL KITS WILL **NOT** VOID YOUR PRINTER'S WARRANTY.

**BWARE** OF INFERIOR COPIES, BUY THE "ORIGINAL" REFILL KIT!



**REUSE  
RECYCLE  
REFILL**

**FREECALL OUR FRIENDLY STAFF!**

**1800 680 605**

PH - (07) 3245 2411 FAX - (07) 3245 2755



AUSTRALIAN MANUFACTURERS  
AND PROUD OF IT!



**NEW REALITY RESOURCES PTY. LTD.**

**FREECALL - 1800 680 605**

**PHONE - (07) 3245 2411**

**FAX - (07) 3245 2755**

**Bayside Business Park**

**Shop 1 / 68-72 Redland Bay Rd**

**Capalaba QLD 4157**



FREE AUSTRALIA WIDE DELIVERY! SAME DAY DISPATCH!!  
COD \* MONEY ORDER \* CHEQUE \* MASTER \* VISA \* BANKCARD \* AMEX ACCEPTED



# 30 YEARS IN BUSINESS MARK 1 COMPUTER SYSTEMS

## COMPUTERS

PENTIUM-100/133	\$895/\$1020
PENTIUM-166/200	\$1095/\$1180
PENTIUM-MMX 200/233	\$1260/\$1340
PENTIUM II 233/266	\$1395/\$1570
PENTIUM II 300/333	\$1790/\$2800
PENTIUM II 350/400	\$CALL/\$2800

## MEMORY

1/4 MB-60 30 PIN	\$10/\$20
4/8 MB-60 72 PIN	\$20/\$25
16/32/64 MB-60 72 PIN	\$50/\$100/\$200
16/32/64MB-10 168 PIN	\$50/\$100/\$200

FOR TOSHIBA, NEC, IBM, COMPAQ  
NOTEBOOKS MEMORY PLEASE CALL

## HARD DISKS

2.1/2.8/3.2 IDE	\$243/\$310/\$330
3.5/3.8/4.2 IDE	\$350/\$365/\$375
10MB ZIP DRIVE 100MB	\$160
CARTRIDGES 100MB	\$20

## FREE INSTALLATION FOR ALL PRODUCTS OFFERED

PRICES SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

## CPU'S

PENTIUM-100/133	\$140/\$175
PENTIUM-166/166 MMX	\$195/\$195
PENTIUM-200/200 MMX	\$295/\$250
PENTIUM 233 MMX	\$290
PENTIUM II 233/266	\$440/475
PENTIUM II 300/333	\$650/\$800
PENTIUM II 350/400	\$999/CALL

## PRINTERS

HP DESKJET 670/690C	\$249/\$360
HP LASERJET 6/L/6/P LASER	\$590/\$1160
CANON BJC210/4200	\$160/\$255
EPSON STYLUS 600/800	\$360/\$440

## INK REFILLS FOR DESKJET CARTRIDGES

SAVINGS OF MORE THAN 80%  
BLACK \$22 COLOUR \$3

## MULTIMEDIA

TOSHIBA DVD KIT	\$450
CD RECORDER MITSUMI KIT & S/W 2XW 6XR	\$540
CD RECORDER PANASONIC KIT & S/W 4XW 6XR	\$720
CD-ROM 12X/16X IDE	\$100/\$120
CD-ROM 24X/32X IDE	\$120/\$140
CD-ROM SCSI 8X/12X	\$200/\$230
CD-ROM SCSI 16X/24X	\$260/\$300
FOR SOUND CARD + STEREO SPEAKERS ADD	\$60

## VIDEO AND ACCELERATOR CARDS

S-3 PCI SVGS 1/2MB MPEG	\$50/\$70
DIAMOND ST. 2000 2MB UPGRADABLE	\$100/\$125
DIAMOND STEALTH II S2200 4MB	\$190
DIAMOND MONSTER 4MB	\$198
DIAMOND MONSTER II 8/12MB	\$280/\$335
DIAMOND VEPER V330 4MB	\$290
MATROX MILL II 4MB UPGRDGL	\$320
MATROX MYST 220 3D 2/4MB	\$190/\$240
MATROX M430 4MB 50MB	\$195
RAINBOW RUNNER FOR MYSTIQUE	\$340
RAINBOW RUNNER FOR MILL	\$395
RAINBOW RUNNER FOR TV TUNER FR MYST	\$160
STUDIO (RAINBOW RUNNER MYST TV TUNER)	\$575

## MODEM FAX DATA VOICE

FREE INSTALLATION, CONNECTION TO INTERNET & NETSCAPE BROWSER WITH EVERY MODEM	
MODEM INTERNAL 33.6BPS	\$90
MODEM EXTERNAL 33.6BPS	\$100
MODEM INTERNAL 56BPS	\$140
MODEM EXTERNAL 56BPS	\$150

## SOUND CARDS

SOUND CARD ESS 16 BIT	\$40
YAMAHA 32 VS 16 BIT	\$70
SOUNDBLASTER 16 BIT	\$75
SOUNDBLASTER 32	\$120
SOUNDBLASTER 64	\$145
SOUNDBLASTER 64 GOLD	\$320

## MOTHERBOARDS

486 PCI	\$100
PENTIUM VX PRO CHIP SET	\$110
INTEL TX PENTIUM	\$140
INTEL LX PENTIUM II AGP ATX	\$220
SUPERMICRO PENTIUM	\$198
SUPERMICRO PENTIUM II DUAL	\$275
PENTIUM PROFESSIONAL	\$200

EXPRESS DELIVERY UNDER 500G \$7, 3KG \$10  
67 BLACKSHAW AVE., MORTDALE 2223  
PH: 9570 1215 FAX: 9570 9063

DEALER INQUIRIES INVITED

## Network Hardware Starter Pac's

### Cards

ISA 16 Bit	\$28.00
PCI 32 Bit	\$32.00
PCI 10/100 Fast	\$55.00
PCMCIA BNC/UTP	\$115.00
PCMCIA 10/100 Fast	\$269.00

### Cables

2 Metre	\$7.95
10 Metre	\$12.00
20 Metre	\$20.00
Made to Order	\$ Call

Straight or Crossed Available

### Sockets

Wall Mount Sockets 1-3 Outlets  
Phone/Fax & Computer \$ Call

### Cat 5 Wire

Wire (per Metre) \$0.60

### PC-PC 10 Base T Pac

2 x PCI 32 Bit Cards.  
1 x 5 Port 10T Hub  
2 x 10 m Cables. **\$149.00**

### PC-PC 100 Base T Pac

1 x PCI 32 Bit Card  
1 x PCMCIA BNC/UTP Card  
1 x 5 Port 10T Hub  
2 x 10 m Cables **\$239.00**

### PC-Laptop 100 Base T Pac

**\$520.00**

### Agents

Victoria: BEC Systems Ph (03) 9386 6401  
Fax (03) 9383 3234  
Tasmania: Balm Ent. Ph (03) 6272 2486  
Agent inquiries welcome from NSW,SA,WA & NT

### Hubs

5 Port 10 Base T	\$79.00
9 Port 10 Base T	\$99.00
4 Port 100 Base T	\$199.00
8 Port 100 Base T	\$249.00
16 Port Rackmount	\$1499.00
24 Port Rackmount	\$1999.00

All Prices include Sales Tax.  
\$8.00 per Order P/P anywhere in Australia  
\$5.00 per Order COD.

Installation, Service & Support Available

Ph. 07 3371 6001

Fax. 07 3371 6199

Critical Systems (Aust) Pty Ltd

## Overnight Copies!

### CD-R

#### DUPLICATION

Up to 500 Copies in 24 Hrs  
Highest Grade CDR Media  
Single or Multi Colour Printing  
Silk Screen Printing  
Gold, Silver or White Surface  
Bulk CD-ROM Pressing  
Pre-mastering from ZIP/LS120  
Competitive Prices

### Diskette

Up to 10,000 Copies in 24Hrs  
Disk Labeling & Label Printing  
Highest Quality Bulk Media  
Competitive Prices

Call Now  
For Best Quote

### DiskMax

Tel: 02 9953 9597

Fax: 02 9953 7658

john@diskmax.com.au

www.diskmax.com.au

## DATA DEFENDER

# CD-ROM Duplication & Pressing

Call for  
low prices  
(02) 9635 3358

www.fast.net.au/niko  
Parramatta

- CD Printing
- Graphic Design

- Data
- Audio
- Picture
- Video



Up 'n' Aw@y  
Net Solutions  
Business & Personal  
Fast Internet Access  
Perth & Rockingham  
Web Hosting and Design  
79 Canning Hwy (near Brandon St)  
South Perth WA 6151  
Ph: (08) 9367 9088  
Fax: (08) 9367 9488  
http://www.upnaway.com

## SHARK ATTACK!!



SHARK 250  
\$499



**Smallest.** Small enough to fit in your shirt pocket (290% smaller than other removable media drives). 2.5" 250Mb HARDiskettes are rugged, smaller and easier to handle, transport and store. **Fastest.** Fast enough to run applications, as well as full motion video and audio (average seek time: less than 12msec). Transfers data extremely fast, identical to hard disk access. **Easiest.** Installs in less than 5 minutes. Unique parallel port set-up. Draws power from your computer; no wall socket or plug-pack required.



BITS Pty Limited  
L5-111-117 Devonshire Street  
Surry Hills NSW 2010  
Ph. (02) 9310 3199

THE AVATAR SHARK 250 MOBILE HARD DRIVE  
THE WORLD'S SMALLEST, FASTEST, EASIEST WAY TO TAKE YOUR DATA ANYWHERE









# POLYGON SYSTEMS PTY. LTD.

## Ph: 9518 9745 Fax: 9518 9746

Shop 6, 233 Harris St, Pyrmont NSW 2009  
Hours 9.00 - 5.30 Mon-Fri, 10.00 - 4.00 Saturday  
5 minutes from Darling Harbour

Open 7 Days.  
Thursday Late Nights

## Polygon Computer System Special



Intel Pentium II 300MHz \$2349  
Intel Pentium II 333 \$2599

- 64Mb SD RAM
- 15" Digital N/I Colour Monitor
- 4.3Gb Hard Disk Drive
- S3 4Mb Video Graphics PCI card



- Yamaha Sound Card
- 120-Watt Speakers
- 33Kbps Voice Fax/Modem
- Windows '95 and Lotus SS97
- Medium Tower Case
- 32x CDROM
- Canon BJC 255SP Printer
- Umax Astra 610P Scanner

### Notebook Specials

**Compaq Amada 1560** \$2399  
P-166MMX, 12.1" CSTN, 2.1Gb HDD,  
16Mb EDO RAM, Win 95

**Micron P-133MMX** \$2499  
12.1" DSTN, 48Mb RAM, 2.1Gb HDD,  
8 x CD, 16 Bit S/C, Carry Case

**Toshiba 310CDS** \$2649  
12.1" TFT/ACTIVE Screen, P-  
200MMX, 32Mb Ram, 2Gb HDD, 16  
bit S/C, 16 x CD, Win 95, Lotus SS

**Acer Extensa 367D** \$2799  
P-166MMX, 12.1" FSTN, 16Mb, 2.1Gb,  
16 Bit S/C, 20 X CD, Win 95

**Oris Sonata P-233 MMX** \$3099  
12.1" TFT, 32Mb Ram, 2.1Gb HDD,  
1.44Mb FDD, 24x CD ROM, Win 98,

Extra NiMH Battery  
**Diamond P-233MMX** \$3099  
12.1" TFT/ACTIVE Screen, 32Mb Ram,  
3.2Gb HDD, 20x CD ROM, Win 95 and

Lotus Smart Suite 97  
**Toshiba 310CDT** \$3349  
12.1" TFT, P-200MMX, 32Mb RAM,  
2Gb HDD, 16x CD, Win 95

Prices are subject to change without notice. All sale items are cash items only prices.  
Polygon Systems shall not be liable for errors or omissions herein.

### Clearance Sale!!!

Mitsubishi 32X Speed E-IDE CD-ROM \$125  
Netcomm Roadster II 56k SVD (EXT) \$275  
Dynamink PCMCIA 56K Fax/Modem (OEM) \$275  
UMAX Astra 610P Colour Flatbed Scanner \$199  
UMAX Astra 1220P Colour Flatbed Scanner \$369  
UMAX Astra 610S Colour Flatbed Scanner \$359  
Canon BJC-255SP \$179  
Epson Stylus 600 Colour inkjet printer \$399  
Epson Stylus Photo Ex Colour Pinter \$849  
SONY 15" Digital Trinitron N/I Monitor \$599  
Mitsubishi Diamond View 17" Monitor \$699

For any Computing Needs and latest prices.... Give us a CALL FIRST.

# BULK INKJET REFILLS

STROUDCO  
Specialists in Inkjet Solutions

'INKJET REFILL SECRETS'  
FREE with every order

- ♦ How to save 95% on printing
- ♦ Rectify common printing problems
- ♦ Refilling as a business
- ♦ Water Proof Printing

## BLACK REFILLS from only \$25.00

PRINTER	NO. OF FILLS	KIT NO
CANON BJ30/70/80 BCI-10/11 BK	30/80	C10
CANON BJ10/BJ200/BJ210/BJ210sp/BJ240	7	C2/C2A
CANON BJC600/610/620	15	C5
CANON BJC4000/4100/4200/4550 BCI-21/20	50/8	C8
CANON BJC 7000	12	C15
HP DESKJET 400, 500 & 600 SERIES	7	H2/H4
HP DESKJET 820C/850C/855C/870C/1000C	6	H6
HP DESKJET PORTABLE HP51633A	8	H1
HP DESKJET 1200 B, Y, C, M	6	H8
EPSON STYLUS 400/800/1000	6	E1
EPSON STYLUS COLOUR / PRO / XL	6	E2
EPSON STYLUS \$20 / COLOUR 11/11S/200	12	E4
EPSON COLOUR 400/500/600/700/Photo Ex	12	E7
EPSON COLOUR 800/850/1520	8	E7
IBM 4076/LEXMARK	6	M1
OLIVETTI	8	H1
XEROX 4004/C.ITOH CJ300	6	M3

## COLOUR REFILLS from only \$35.00

PRINTER	NO. OF FILLS OF EACH COLOUR	KIT NO
CANON BJC70/80	60	C11
CANON BJC210/BJC210sp/BJC240	10	C3
CANON BJC600/610/620	8	C6
CANON BJC4000/4100/4200/4550 BCI-21	30	C9
CANON BJC 7000	6	C16
HP DESKJET 400, 500 & 600 SERIES	12	H3/H5
HP DESKJET 820C/850C/855C/870C/1000C	6	H7
EPSON STYLUS COLOUR / PRO / XL	6	E3
EPSON STYLUS 820/COLOUR/11/11S	12	E5
EPSON COLOUR 200/400/500/600/800/1520	12	E8/E9
IBM 4076/Lexmark	6	M2

PHOTO CARTRIDGE REFILLS AVAILABLE  
BULK INK AVAILABLE  
WEB: www.stroudco.com

PHONE / FAX ORDERS  
& ENQUIRIES  
(03) 9720 9946

Fast Service Same Day Dispatch  
Money Order, Cheque, C.O.D.,  
Credit Cards Accepted

PO Box 729, Heathmont, Victoria 3135

## CD-ROM Duplication

Fast Efficient Service

From 1 to 500 CDs copied overnight!  
CD-R Duplication  
CD Rom Mass Replication  
Full Color "Picture Disc" Printing  
CD Recorder Kits, CD-R Media  
& Duplication Equipment

CD Solutions Pro Series Printing Kit

Print Photo Realistic images  
directly onto your own CD's.  
Call for Free Printed Sample!

Ph 1800 463 463

MULTITECH  
TRADING PTY LTD sales@multi-tech.com.au

## # 1 SOURCE FOR MEMORY, PERIPHERALS & UPGRADES

SIMM / DIMM / SD RAM	DELL MEMORY	SUN MEMORY
<b>NEW!!! INTEL APPROVED PC100 MEMORY</b>	<b>DELL MEMORY</b>	<b>SUN MEMORY</b>
128MB - 10NS SD RAM \$335.00	LATITUDE CP, LM, LX 16MB, 32MB, 64MB SPARC SERVER 16MB, 32MB, 64MB	
64MB - 10NS SD RAM \$170.00	LATITUDE XP, XPIC, XPICD 8MB, 16MB, 32MB SPARC STATION 16MB, 32MB, 64MB	
32MB - 10NS SD RAM \$90.00	DIMENSION ALL MODELS 16MB, 32MB, 64MB ULTRA 32MB, 64MB, 128MB	
64MB - 60NS EDO \$190.00	OPTIPLEX ALL MODELS 16MB, 32MB, 64MB ULTRA ENT 3000-6000 64MB, 256MB	
32MB - 60NS EDO \$80.00		
16MB - 60NS EDO \$48.00	<b>DEC MEMORY</b>	<b>HP MEMORY</b>
8MB - 60NS EDO \$28.00	HINOTE ULTRA II 16MB, 32MB, 64MB HP VECTRA / BRIO 8MB, 16MB, 32MB, 64MB	
	HINOTE VP, CS, LS 16MB, 32MB, 64MB HP OMNIBOOK 8MB, 16MB, 32MB, 64MB	
<b>NON PARITY</b>	DEC ALPHA 16MB, 32MB, 64MB	<b>TOSHIBA MEMORY</b>
64MB - 60/70NS FPM \$199.00	DEC PRIORIS 8MB, 16MB, 32MB	LIBERETTO-50, 30, 20 16MB
32MB - 60/70NS FPM \$90.00	DEC PC 8MB, 16MB, 32MB	TECRA-500, 510CDS, PRO 8MB, 16MB, 32MB, 64MB
16MB - 60/70NS FPM \$48.00	CELEBRIS 64MB, 128MB, 256MB KITS	PROTEGE610, 650, 660 8MB, 16MB, 32MB, 64MB
8MB - 60/70NS FPM \$28.00	VENTURIS 16MB, 32MB, 64MB	T4850, T4900, 1900 8MB, 16MB, 32MB, 64MB
4MB - 30PIN SIMM \$20.00		SATELLITE-100, 200, 400 8MB, 16MB, 32MB, 64MB
<b>ALL PRICES QUOTED ARE EX-TAX 22%</b>	<b>IBM MEMORY</b>	
<b>PRINTER MEMORY</b>	IBM THINKPAD 8MB, 16MB, 32MB, 64MB T4600, 4700, 4800 8MB, 16MB, 32MB, 64MB	
BROTHER HL SERIES- 2MB, 4MB, 8MB, 16MB	PS/2 (ALL MODELS) 8MB, 16MB, 32MB T2100 SERIES 8MB, 16MB, 32MB, 64MB	
CANON LBP/BJC ALL- 2MB, 4MB, 8MB, 16MB	RISC 6000 16MB, 32MB, 64MB, 128MB	
SHARP JX SERIES- 1MB, 2MB, 4MB KITS	VALUE POINT (All Models) 16MB, 32MB, 64MB	
DATA PRODUCTS SERIES- 2MB, 4MB, 8MB	APTIVA (All Models) 16MB, 32MB, 64MB	
EPSON ACTION LASER- 2MB, 4MB, 8MB	PC 300/SERVER 16MB, 32MB, 64MB, 128MB	
HP LASER/DESK JET- 8MB, 16MB, 32MB		
LEXMARK PRINTER- 2MB, 4MB, 8MB, 16MB	<b>NEC MEMORY</b>	
	NEC VERSA 4000, 6000 16MB, 32MB, 64MB	
<b>ACER/TEXAS MEMORY</b>	NEC VERSA 2600, 2700 8MB, 16MB, 32MB	
ACERNOTE 300, 700, 900 8MB, 16MB, 32MB	NEC VERSA 5000, 500 16MB, 32MB, 64MB	
EXTENSA/TRAVEL MATE 8MB, 16MB, 32MB	NEC ULTRA LITE, SL25C 8MB, 16MB, 32MB	
ACERNOTE LITE ALL 8MB, 16MB, 32MB	NEC VERSA E.V.M.P.S 8MB, 16MB, 32MB	
ACER ALTOS, POWER 16MB, 32MB, 64MB	NEC ULTRALITE486SX 12MB, 16MB, 32MB	
<b>AST MEMORY</b>	<b>SHARP MEMORY</b>	
ASCENTIA A, P, J SERIES 8MB, 16MB, 32MB PC-3010, 3030, 3040, 3060, 3070 8MB, 16MB		
ASCENTIA 800, BRAVO 16MB, 32MB, 64MB PC-9000, 9030, 9300, 9020 8MB, 16MB, 32MB		
ADVANTAGE 16MB, 32MB, 64MB PC-9040, 9070 8MB, 16MB, 32MB		
MANHATTAN 16MB, 32MB, 64MB PC-9080, 9800T 8MB, 16MB, 32MB		
<b>CANON MEMORY</b>	<b>D/CAMERAS MEMORY</b>	
NOTEJET II SERIES 8MB, 16MB	PC-9300D/T, 9330T, 9340T, 9320T 8MB, 16MB	
NOTEJET 486 ALL MODELS 4MB, 8MB, 16MB		
INNOVA SERIES 8MB, 16MB, 24MB	AGFA, CANON, CASIO, CHINON, DYCAM, FUJII, KODAK, MICRON, MINOLTA, NIKON	
<b>COMPAQ MEMORY</b>		
ARMADA ALL SERIES 16MB, 32MB, 64MB		
LITE, ELITE, LITE 8MB, 16MB, 32MB		
CONCERTO 8MB, 16MB, 32MB		
CONTURA 8MB, 16MB, 32MB		
DESKPRO 16MB, 32MB, 64MB		
PRESARIO 16MB, 32MB, 64MB		
PROLIANT 16MB, 32MB, 64MB, 128MB		
COMPANION - HPC 16MB, 20MB, 32MB		

**ALL PRICES ARE EX-TAX 22%**  
**DEALERS CALL US FOR SPECIAL PRICES & 14 DAYS ACCOUNT**

**Memoryworld**  
G/F, 109 Alexander Street, CrowsNest 2065  
TEL: (02) 9906 4533 FAX: (02) 9906 1871  
EMAIL: buy@memoryworld.com.au

**PC-BUILD TO ORDER**  
QUOTES FOR NEW SYSTEMS-INTEL / AMD  
PENTIUM PRO, MMX, PENTIUM II - CALL !!!!  
WE WILL BEAT ANY GENUINE QUOTES.





**30632-1 Turtle Kit** complete with interface, power supply and DOS/Windows software. Teach the turtle to run a set path or make it look for the brightest source of light!  
\$381 ex-tax. \$438 inc-tax.

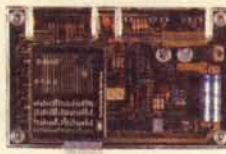


**30330 Profi Computing Kit.** Makes 12 models including: turtle, robot arm, sorting and parcel-turning machines, CD-player. Total of 888 parts with interface, power supply and DOS/Windows software.  
\$556.50 ex-tax. \$655 inc-tax.



**30400 Mobile Robots Kit.** Makes 8 models including: stamping machine, sliding door, pulse counter and five mobile models. Uses the new 'intelligent' interface. Software and instructions are provided on CD-ROM. Programmed in flow-chart style language (LLWIN) that's easy to learn and understand. \$607 ex-tax. \$695 inc-tax.

**30408 Industry Robots Kit.** Makes 4 models and contains over 500 parts. Requires 30402 interface. Available soon!



**30520 Parallel port interface unit.** Provides 4 motor outputs, 8 digital inputs and 2 analogue inputs. Also provided is a special plug unit and software drivers for QBASIC, C, TurboPascal and VB.  
\$164.80 ex-tax. \$189 inc-tax.

**30402 Intelligent interface unit.** Plugs into any coms port. Same capability as above but allows stand-alone control without computer. May be controlled directly from the computer using most languages or 'down-load' a program using LLWIN (supplied separately). \$351 ex-tax. \$395 inc-tax.

### SOFTWARE AVAILABLE:

<b>30521WIN32</b>	32 bit software for 30330 kit source in VB5 & Delphi 3.	\$199
<b>30403</b>	LLWIN for 30520 interface	\$99
<b>30407CD</b>	LLWIN for 30402 interface	\$199
<b>30555CD</b>	PC-LOGO for 30520 interface	\$225

Fischertechnik is recommended by Steve Cramer - winner of the US presidential award for science teaching. Non-computer controlled kits are available, including: Profi solar, pneumatic, sensoric and bionics. Spare parts and industrial models available. Delivery Australia-wide: \$15. Agents for Australia and NZ.

## PROCON TECHNOLOGY PH: (03) 98075660 FAX: (03) 98078220

BC, MC & Visa accepted. Email: [procon@tpgi.com.au](mailto:procon@tpgi.com.au) Website: <http://www1.tpgi.com.au/users/p8king/>

## INKJET CARTRIDGE REFILL KITS

Cut your inkjet printing cost's by up to 80%

### BLACK KITS FROM \$27.90

#### PRINTER

HP Desk Jet 400/500	K1BK	\$29.90
HP Desk Jet 600/660/690/692/694 series	K2BK	\$29.90
HP Desk Jet 850C/855C/870C series	K3BK	\$34.90
HP Desk Jet /DeskWriter/Portable/Design Jet/300	K4BK	\$29.90
HP Desk Jet 1200/1600	K5BK	\$34.90
Canon BJ-30 /BJC-70 /BJC-80	K6BK	\$29.90
Canon BC-01/02 BJ-10E/20/BJ-200/BJC-210	K8BK	\$29.90
Canon BJ-300/330	K9BK	\$27.90
Canon BJC-600/610/620	K10BK	\$29.90
Canon BJC-800/820/880	K11BK	\$29.90
Canon BJC-4000/4100/4200/4550 BC-20 & BC-21	K12BK	\$29.90
Canon BJC-4200 photo BC-22e	K19BK	\$29.90
Canon BJC 7000 With 120ml black & 120ml clear	K13BK	\$29.90
Epson stylus color 800/1520	K14BK	\$29.90
Epson Stylus 800/800+/1000	K15BK	\$29.90
Epson Stylus Color Pro/xl	K16BK	\$29.90
Epson Stylus 820/Color 11/11S	K17BK	\$29.90
Epson Stylus Color 200/400/600/800	K 7 BK	\$29.90
Epson Stylus Color 500	K20BK	\$29.90
Epson Stylus Photo/Photo EX/ 700 Photo	K18BK	\$29.90
Lexmark / IBM 4076/1020		

### COLOUR KITS FROM \$37.90

#### COLOUR

7	K9CLR	\$39.90
7	K10CLR	\$39.90
6	K11CLR	\$39.90
8	K9CLR	\$39.90
6	K12CLR	\$39.90
60	K1CLR	\$39.90
7	K2CLR	\$39.90
7		
15	K3CLR	\$39.90
8	K4CLR	\$39.90
8	K5CLR	\$39.90
50/8	K18CLR	\$49.90
12	K15CLR	\$69.90
12	K8CLR	\$39.90
12		
8	K6CLR	\$38.90
8	K7CLR	\$39.90
12	K8CLR	\$39.90
12	K8CLR	\$39.90
12	K17CLR	\$59.90
12	K13CLR	\$39.90

**BUY THREE KITS**  
GET ONE FREE

It's child's play.

Water fast inks.

Photo & Neon inks.

Some competitors will try to mislead you by telling you you will get more refills than they deliver. Ask for the volume

Better than original OEM inks

Up to 60 refills per kit



**RECOJET**  
International

**FREE - CALL**  
**1800 809 047**

**FREE AUSTRALIA WIDE DELIVERY**  
C.O.D.

2 Iona Court,  
Alexandra Hills,  
Queensland 4161

**PH 07 3824 7800**  
**FAX 07 3824 7799**

P.O. BOX 1042.  
CAPALABA,  
QUEENSLAND 4157

Recojet International advertises on this page only and Does not want to be confused with others that advertise in this fine publication

RE-SELLERS WANTED BUY DIRECT FROM THE MANUFACTURER  
Email: [recojet@compuserve.com](mailto:recojet@compuserve.com)



# ALTIMA Notebook Computers

**Build-to-Order. Any configuration welcome. Sample configurations and prices below.**

## 1. Maestro Te/TeS model:

Pentium 266MMX, 12.1" screen, 32MB SDRAM, 2.1GB HDD, 20x CD-ROM built-in, FDD built-in, 2MB Video RAM, TV Output, 16 Bit 3D sound, Carry Bag, Universal Charger. Back Up CD, and Windows 95 CD-ROM.

TFT: **\$2900.** Li-Ion battery.

DSTN: **\$2300.** NiMH battery.

Back Up CD and Windows 95 CD-ROM.

## 32. Supreme Ite model:

Pentium II 300MHz w/MMX. 14.2" XGA (1024x768) TFT, 32MB SDRAM, 2.1 GB HDD, 20x CD, FDD built-in, 4MB Video SGRAM (3D Graphics), TV Output, 16 Bit 3D Sound, Carry Bag, Universal Charger. Back Up CD and Windows 95 CD-ROM, **\$5300.**



For the latest pricing, please contact us at:  
**Altima Computers Pty. Ltd.**

Unit 4, 48 Park Road, Cabramatta, NSW 2166.

Phone: (02) 9755 7835 Fax: (02) 9755 7917

A.C.N. 082 460 419.

for more info go to Internet: <http://www.altima.com>

**Excellent Value and Upgradable Performance. 12 Months Manufacturer's Warranty. Made in Taiwan.**

## Have you spoken to your Palm lately?

### The Ultimate Mobile Office

- E-Mail • Remote Dial-In •
- Web Browsing • Faxing •

**Sagem RD750**  
Mobile Data Phone



Solutions for  
other PDA's  
available

**Palm III**  
Connected Organiser



*Managers: Keep in touch with the office from anywhere in the world. Send & receive E-mail, Faxes, get messages from your office computer.*

*Salespeople: Have everything at your fingertips! Check stock levels on the fly, latest pricing, faster and more accurate quotes!*

• Enquire about our "car kit"



*The Connection Specialists*

**www.swann.com.au**  
**177 Burnley St. Richmond**  
**Sales Hotline: 1800 066336**

Dealer Enquiries Welcome



**A single database engine with lightning-fast, high-volume transactional processing and powerful industry-standard SQL capabilities.**

- Run your app's up to 20 times faster without modification!**



**Ideal to use with these RAD tools - DataFlex PowerFlex Clarion Magic**  
**Call FMS (03) 9699 9899, email [btrieve@btrieve.com.au](mailto:btrieve@btrieve.com.au) for your eval. copy.**

**HOURS 9.00AM TO 5.00PM MON-FRI, 9.00AM TO 12.00PM SAT**

**ALL PRICES INCLUDE SALES TAX SEND YOUR EMAIL TO: [ritepic@tpgi.com.au](mailto:ritepic@tpgi.com.au) PLACE ORDERS VIA PHONE (03) 5672 4887 FAX: (03) 5672 4410**



# F-SECURE



## CounterSign™ Security with F-Secure Anti-Virus

The revolutionary CounterSign™ Technology is the world's first multi-layered anti-virus architecture that performs simultaneous virus scans using several engines and methods.

### F-Secure Anti-Virus Superiority:

- Centralised installation and administration
- Daily updates
- Macro Control allows approved macros and deletes or disinfects unknown macros.
- F-Secure Anti-Virus for Firewalls checks files before they are transferred through the network
- Mail Gateway stops email viruses before arrival

Awarded F-PROT Professional with CounterSign™ Technology is now F-Secure Anti-Virus.

### Data Fellows Success Story:

1991 World's 1<sup>st</sup> Heuristic Anti-Virus Engine, 1993 World's 1<sup>st</sup> Anti-Virus Network Administration, 1995 World's 1<sup>st</sup> Windows Real Time Scanner, 1997 Revolutionary F-Secure Anti-Virus CounterSign™ Technology

Authorised F-Secure distributor:

**Open Systems Pty. Ltd.**

Churchill House, 218 Northbourne Ave. Braddon ACT 2612  
AUSTRALIA  
Tel: +61-2-6261 4900 Fax: +61-2-6257 9800  
Email: info@opensystems.com.au  
Internet: www.opensystems.com.au

DATA FELLOWS

### "PLAIN WRAP PRICES. BLACK TIE SERVICES."



**NUTTERS**  
COMPUTER WHOLESALE

Tel. (03) 5823 1249  
Fax 1 800 644 321  
www.daitronics.com.au  
email: sales@daitronics.com.au  
Call for web password to access full price list

### Dealer/Govt/Corp

- \$10 Ansett Air
- All Prices Exc Sales Tax
- Min Order \$250
- \* Prices subject to change

#### CD/WRITER

- SONY 2/8 SCSI or IDE \$395
- KODAK 2/8 Incl. software \$395
- KODAK BLANK CD's \$59/25
- SAMSUNG CD's BOX 10 \$20

#### MOTHERBOARDS (PENTIUM)

- INTEL EX C/S \$149
- INTEL LX C/S \$159
- INTEL BX C/S \$199

#### CPU's

- IDT 200MX \$89
- K6/300 MX \$199
- PENT C II/266 \$165
- PENT C II/300 \$199
- PENT II/300 \$379
- PENT II/350 \$750
- PENT II 400 \$995
- PENT II/450 \$1150

#### MEMORY

- 16MB EDO \$25
- 32/EDO/SD \$49
- 64/SD \$115
- 128 SD \$220
- 64 SD/100X \$175
- 128 SD/100X \$340
- OLD MEMORY \$CALL

#### CASES

- 7 BAY TOWER CD \$340
- MT/DT \$36
- MEDIUM TOWER \$47
- ATX MED \$99
- ATX FULL \$169
- ATX MICRO \$85
- CD/HDD CASES \$125

#### VIDEO CARDS

- S3 TRIO 2MB \$30
- S3 VIRGE 2MB \$40
- S3 VIRGE 4MB \$50
- 4MB/TRIENT AGP \$59
- INTEL 8MB/AGP \$99
- VOO DOO I \$120
- VOO DOO II \$220

#### MONITORS

- SAMTRON 481 \$199
- SAMTRON 5E1 \$259
- SAMTRON 7E1 \$499
- SAMSUNG 400B \$210
- SAMSUNG 500B \$299
- SAMSUNG 500MB \$355
- SAMSUNG 20" \$1295
- SONY 15" \$470
- SONY 17" \$995

#### TAPE BACKUPS

- 8/16 SONY DAT \$1050
- 3.4GB STARSTATION \$199
- 8GB ?????? \$475

#### HARD DISKS

- 2.1 SEAGATE \$195
- 2.1 QUANTUM \$210
- 3.2 SEAGATE \$220
- 4.0 QUANTUM \$225
- 6.0 QUANTUM \$265
- 6.5 QUANTUM \$285
- 8.4 QUANTUM \$350
- 4.5 IBM/SCSI \$399
- 8.5 QUANT/SCSI \$599
- 10.3 QUANTUM \$499

#### CD ROMS/SC

- LITE ON 32X \$75
- SONY 32X \$90
- TEAC 32X \$95
- TEAC SCSI \$150
- ESS S/C \$18
- ESS/PCI/WAVE \$35
- S/B VIBRA \$49
- S/B AWE64 \$75

#### FAX/MODEM

- BANSKIA 33.6 \$59
- NETCOM 56.6 \$99
- AUSLIX 56.6E \$110
- AUSTRALINX 33.6E \$75
- PCMCIA 33.6 \$165
- PCMCIA 56.6 \$199

#### PRINTERS

- CANON 255 \$139
- CANON 4200 \$199
- CANON 7000 \$479
- CANON 6PPM \$399
- CANON 17PPM \$1490
- HP 670 \$199
- HP 5L \$579

#### UPS

- SOLA 300?? \$169
- SOLA 400?? \$219
- SOLA 750?? \$395
- SOLA 1000?? \$CALL

#### COMPUTER SPECIALS

- PENTIUM II/266C \$995
- PENTIUM II/300C \$1095
- IDT 200MMX \$880
- PENTIUM II/300 \$1250
- PENTIUM II/350 \$1650
- All complete 14" monitor
- K/B MOUSE etc

#### NOTEBOOK

- MITAC/12" TFT/ACTIVE
- 20x CD, 32Mb2MB, WIN 98/2.1HDD
- 200MX \$2300
- 233MMX \$2400
- 300/II \$2950

#### SCANNERS FLATBEDS

- VULUX 9200 \$129
- VULUX 19200 \$169
- CANON 310 \$149
- CANON 610 \$250
- HP5100C \$350
- HP6100 \$950

#### NETWORK

- ISA/DLINK \$12
- PCI/10MB \$22
- PCI/100/10 \$49
- INTEL 10/100 \$99
- 3COM 10/100 \$97
- INTEL PCI/100TX \$95
- 8 PORT HUB \$79
- 16 PORT HUB \$149
- 4 PORT 10/100 \$199
- 8 PORT 10/100 \$599
- 12 PORT 10/100 \$699
- PCMCIA 10 \$99
- PCMCIA 100/10 \$199
- Call full range.

## Computer Fairs Australia



### SEPTEMBER 1998

M	T	W	T	F	Sat	Sun
	1	2	3	4	5 Canberra	6 Wollongong
7	8	9	10	11	12 Erina	13 Newcastle
14	15	16	17	18	19	20 Leichhardt
21	22	23	24	25	26 Parramatta	27
28	29	30				

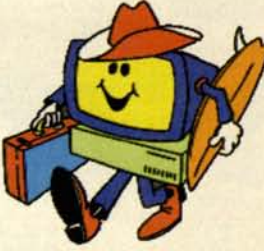
### OCTOBER 1998

M	T	W	T	F	Sat	Sun
			1	2	3	4 Wollongong
5	6	7	8	9	10 Erina	11 Newcastle
12	13	14	15	16	17 Canberra	18 Leichhardt
19	20	21	22	23	24 Parramatta	25
26	27	28	29	30	31 Bathurst	

Parramatta Parramatta Town Hall Church Street Parramatta	Leichhardt Leichhardt Town Hall Norton Street Leichhardt	Wollongong BHP Sports Stadium Waples Road Unanderra	Canberra National Hockey Centre Mouat Street Lyneham
Bathurst Bathurst Showground Great Western Hwy Bathurst	Newcastle Newcastle PCYC Melbourne Road Broadmeadow	Central Coast Erina High School The Entrance Road Erina	New Venue??

Open 10am - 3pm  
Entry \$2 (Kids FREE!)

For enquiries call Hazel & Glenn  
on 0414 96 1117 or visit our web  
site [www.computerfairs.com.au](http://www.computerfairs.com.au)



[computerfairs.com.au](http://computerfairs.com.au)



# CD & Online

FOR ADVERTISING DETAILS PLEASE CALL MORAG KERR ON (02) 9282 8908

## COMPANIES INSIDE

- Access Net Australia
- Accsoft Internet Services
- Independent Software Duplication
- Pulsar
- Techflex

## Internet Services - Unlimited Hours



- \$45 Setup fee, \$50 p.m.
- 150MB downloading p.m.
- 10MB Homepage
- Email address & postbox
- Single-call connection
- Superfast 56K access
- 4-8hr sessions
- Phone support 8-6 p.m.

ACT  
NSW

• Canberra  
• Sydney  
• Newcastle  
• Wollongong  
• Gosford  
• Wisemans Ferry  
• Windsor  
• Penrith  
• Mulgoa  
• Camden  
• Campbelltown  
• Helensburgh  
• Brisbane

SA  
TAS  
VIC

• Gold Coast  
• Adelaide  
• Hobart  
• Melbourne  
• Geelong  
• Mornington  
• Cranbourne  
• Pakenham  
• Emerald  
• Healesville  
• Kinglake  
• Kilmore

WA

• Romsey  
• Gisborne  
• Bacchus Marsh  
• Balliang  
• Lara  
• Perth

QLD

[www.access.net.au](http://www.access.net.au)

[info@access.net.au](mailto:info@access.net.au)

Phone: (03) 9686 4192



**ACCESS  
NET**  
AUSTRALIA

 <b>ZIP PLUS</b> EXTERNAL ZIP DRIVE \$259.95	 <b>WESTERN DIGITAL 6.4 GB</b> WD 2.1GB IDE 229.95 WD 3.2GB IDE 259.95 WD 4.3GB IDE 279.95 WD 6.4GB IDE 339.95 WD 8.4GB IDE 439.95	 <b>QUANTUM 2.1GB SE IDE</b> QUANTUM 2.5GB EL IDE 249.95 QUANTUM 5.1GB EL IDE 339.95 QUANTUM 7.6GB EL IDE 469.95 QUANTUM 10GB EL IDE 649.95 QUANTUM 2.1GB SCSI 349.95 QUANTUM 3.2GB SCSI 389.95 QUANTUM 4.3GB SCSI 519.95 QUANTUM 6.4GB SCSI 679.95 QUANTUM 8.4GB SCSI 829.95	 <b>100MB SONY ZIP DISK</b> \$19.45 Buy 5 and save \$18.45	 <b>100MB IOMEGA ZIP DISK</b> \$19.95 Buy 5 and save \$18.95	 <b>10 PACK BLUE CDR MEDIA</b> \$23.00	 <b>KODAK 25 PACK CDR MEDIA</b> \$68.75	 <b>RICOH 5 PACK CDR MEDIA</b> \$14.45
 <b>NUSOUND 3D</b> \$139.95	 <b>SOUND BLASTER 16</b> \$69.95	 <b>12 MB CREATIVE VOODOO 2</b> \$499.95	 <b>RIGHTEOUS 3D FX</b> \$199.95	 <b>12 MB CANOPUS 3DFX 2</b> \$649.95	 <b>8MB MONSTER 3DFX 2</b> \$449.95	 <b>MONSTER 3D FX</b> \$249.95	 <b>56K BANKISA WAVE SP</b> \$249.95
 <b>56K NETCOM ROADSTER 2</b> \$279.95	 <b>INTEL 266 PENTIUM 2 CPU AMD 266</b> \$359.95	 <b>CLONE 2940 SCSI CARD</b> \$149.95	 <b>5 PORT HUB</b> \$89.95	 <b>104 KEY KEYBOARD</b> \$19.95	 <b>HYUNDAI 17" MONITOR</b> \$699.95	 <b>PENTIUM MMX M/B</b> \$119.95	
 <b>PANASONIC 8X 4X CDR</b> \$689.95	 <b>EXTERNAL IDE CASE</b> \$139.95	 <b>UMAX 610P FLATBED</b> \$199.95	 <b>SMART TV TUNER</b> \$229.95	 <b>ADAPTEC EASY CD</b> \$169.95	 <b>MIDDLE TOWER CASE</b> \$99.95	 <b>CD STOMPER LABEL KIT</b> \$79.95	
 <b>SAITEK X35F</b> \$139.95	 <b>SIDEWINDER PRES PRO</b> \$119.95	 <b>THRUSTMASTER T2</b> \$199.95	 <b>PLAYSTATION CONSOLE</b> \$185.95	 <b>NINTENDO 64 CONSOLE</b> \$185.95	 <b>PLAYSTATION DUAL</b> \$54.95	 <b>NATIONAL GEOGRAPHIC</b> \$239.95	 <b>BRITANNICA 98</b> \$239.95
 <b>8 MB EDO 72 PIN</b> \$24.95	 <b>16 MB EDO 72 PIN</b> \$39.95	 <b>32 MB EDO 72 PIN</b> \$69.95	 <b>32 MB SDRAM DIMM</b> \$69.95	 <b>64 MB SDRAM DIMM</b> \$159.95	 <b>128 MB SDRAM DIMM</b> \$329.95	<b>CALL FOR OTHER GREAT HARDWARE AND SOFTWARE PRICES!</b>	

ORDER PRIOR TO 12.00 FOR SAME DAY SHIPPING

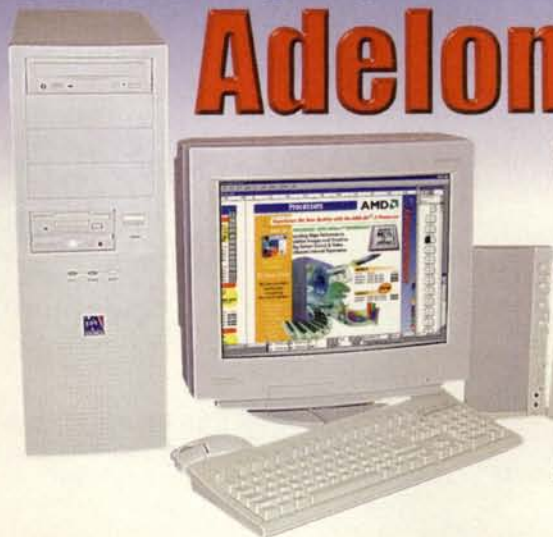
**Pulsar Computers Pty Ltd Shop 39 / 250 Elizabeth Street Melbourne 3000 Tel 03 9639 1733**

Same Day Shipping is Subject To Stock - prices and configurations are subject to change without notice / obligation. We are not responsible for any Typographical errors. We accept All Major Credit Cards. Freight Extra. COD Service Available.



# Winners with... Adelong Computers

September 1998



**\$4190**  
SYADE038

## Advantage Multimedia PII-400

- Intel Pentium II 400MHz
- 512KB Pipeline Burst Cache
- 64MB SDRAM
- 6.5GB Ultra ATA Hard Drive
- 100MB Internal Zip Drive
- Diamond Viper 4MB AGP Video Card
- Creative AWE64 Sound Card
- Jazz 200 Watt Speakers
- 32x CD-ROM
- 17" Mitsubishi Diamond Plus Monitor
- MS Intellimouse
- Honeywell 104KB
- Netcomm Inmodem 56K
- Windows 98
- 3 Year On-site Warranty

'A fast and well featured system with a terrific price makes the Advantage this month's Value winner.'

PC @uthority AUGUST 1998

**Free Call: 1 800 626 345**

**<http://www.adelong.com.au>**

**\$415**  
HDIBM007

## IBM DeskStar 6.4GB Hard Drive

'IBM is definitely onto a winning formula as far as high-performance hard disks go.'

PC @uthority APRIL 1998



## Matrox 8MB G200

'Superior acceleration for professional 2D/3D graphics. Electrifying games experience in addition to high quality video.'

PC MAGAZINE AUGUST 1998



**\$330**  
DCMAT023



## Vantage Value 233MMX

- Cyrix/IBM 233MHz M2 CPU
- 32MB SDRAM
- 3.2 GB Ultra ATA HDD
- 32x ATAPI CDROM
- PnP 16bit Stereo Sound Card
- Amplified Speakers
- 2MB PCI Display Adapter
- 15" SVGA Monitor
- 3 button serial mouse & pad
- Mini tower or desktop case
- Enhanced Win 104 K/B
- Windows 98
- Canon BJC 255SP Printer
- 2yr RTB Warranty

**\$1495**  
SYADE035



- 2/3 Adelong Advantage PC's
- 4/5 DTK Systems
- 6 Processors & Memory, Hard Disks
- 7 AMD Processors
- 8 Chaintech Mainboards
- 9 Toshiba & Oris Laptops Multimedia
- 10 Orchid 3D & Sound Cards
- 11 Matrox Graphics Cards
- 12 Eagle Generic, 3D & Sound Cards

- Audio & Visual Multimedia
- 13 Backups & Media Cases & Power Supplies
- Scanners & Input Devices
- 14 Banksia Modems
- 15 US Robotics Modems Spirit Products
- 16 Syquest Storage Devices
- 17 Panasonic Monitors & Drives
- 18 Mitsubishi Monitors, Input & Storage

- 19 Hansol Monitors & Drives
- 20 Sony Monitors
- Daewoo Monitors
- 21 D-Link Networking Control Cards & Networking
- 22 Traxdata CD Writers & Re-Writers
- 23 Ricoh CD Writers, Re-Writers, & UPS Filters
- 24 Imation SuperDisk Drives
- Specials
- 25 Jazz Speakers

- 26 Canon Printers & Scanners
- 27 Printers
- Ink & Toner Cartridges
- 28 Data Switches & Cables
- 29 Davis Digital Projectors
- 30 Software
- VET Anti-Virus Software
- 31 Software
- 32 Customer Service
- Freight schedule
- Terms & Conditions
- Ordering

**Corporate, Government and Educational Departments**  
**Call our strategical account managers on: (02) 9669 3188**



**Adelong Computers**





## ADVANTAGE PC's

**3 YEAR  
WARRANTY  
ON-SITE**

**NATION WIDE  
INSURANCE UNDERWRITTEN  
WARRANTY**



### Advantage Intel 300-C

Intel 300MHz Celeron® with MMX™  
32MB SDRAM  
4.3GB Ultra ATA Hard Drive  
32 Speed CD-ROM Drive  
3D Wavetable Sound Card  
100W Amplified Speakers  
4MB 3D AGP Display  
15" SVGA Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ATX Tower or Desktop Case  
Windows 98 & IE 4.0  
Integrated Bios Virus Protection

RentSmart for  
**\$93 p/m**  
36 month term

**\$1950**

SYADE007

### Advantage PII-266

Intel 266MHz Pentium® II with MMX™  
32MB SDRAM  
4.3GB Ultra ATA Hard Drive  
32 Speed CD-ROM Drive  
PCI Sound Card  
100W Amplified Speakers  
4MB 3D AGP Graphics Card  
15" Colour Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
Windows 98 & IE 4.0  
Vet Anti-Virus

RentSmart for  
**\$94 p/m**  
36 month term

**\$1975**

SYADE008

### Advantage PII-300

Intel 300MHz Pentium® II with MMX™  
64MB SDRAM  
4.3GB Ultra ATA Hard Drive  
32 Speed CD-ROM Drive  
PCI Sound Card  
100W Amplified Speakers  
4MB 3D AGP Graphics Card  
15" SVGA Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
Windows 98 & IE 4.0  
Vet Anti-Virus

RentSmart for  
**\$92 p/m**  
36 month term

**\$2195**

SYADE018

### Advantage PII-333

Intel 333MHz Pentium® II with MMX™  
64MB SDRAM  
6.4GB Ultra ATA Hard Drive  
32 Speed CD-ROM Drive  
PCI Sound Card  
200W Jazz Surround Speakers  
8MB i740 AGP Graphics Card  
15" Colour Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
Windows 98 & IE 4.0  
Vet Anti-Virus

RentSmart for  
**\$109 p/m**  
36 month term

**\$2595**

SYADE021

### Advantage PII-350

Intel 350MHz Pentium® II with MMX™  
64MB PC-100MHz SDRAM  
Intel BX 66/100MHz Chipset  
8.4GB Ultra ATA Hard Drive  
32 Speed CD-ROM Drive  
PCI Sound Card  
200W Jazz Surround Speakers  
8MB i740 AGP Graphics Card  
15" SVGA Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
Windows 98 & IE 4.0  
Vet Anti-Virus

RentSmart for  
**\$122 p/m**  
36 month term

**\$3095**

SYADE022

### Advantage PII-400

Intel 400MHz Pentium® II with MMX™  
64MB PC-100MHz SDRAM  
Intel BX 66/100MHz Chipset  
8.4GB Ultra ATA Hard Drive  
32 Speed CD-ROM Drive  
PCI Sound Card  
200W Jazz Surround Speakers  
8MB i740 AGP Graphics Card  
15" SVGA Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
Windows 98 & IE 4.0  
Vet Anti-Virus

RentSmart for  
**\$135 p/m**  
36 month term

**\$3450**

SYADE023



With RentSmart,  
you can  
get the best  
business technology,  
plus keep your money  
and put it  
to better use.

Instead of paying  
one large, upfront cost  
you can  
spread affordable  
monthly payments  
over the useful life of  
your equipment.

When your  
equipment  
is used  
solely for business,  
your rentals  
are 100%  
tax deductible.

You can bundle  
together a wide range  
of business equipment,  
software and office  
furniture all into  
one convenient  
RentSmart plan.

RentSmart's documen-  
tation is easy to  
complete and we can  
approve the purchase of  
office equipment worth  
up to \$15,000  
in just 10 minutes.



# ADVANTAGE PC's

MS Homepack  
(with ADE Advantage  
systems only)

**\$99** SWMST046



## SERVICE & SUPPORT

- Lifetime Technical Support Hotline.
- Three-year Nation Wide on Site Warranty.
- 7-Day Customer Satisfaction Guarantee\*
- Average Delivery within 3 to 5 working days

\* Shipping charges to and from customer are not refundable

### Power Advantage PII-300

Intel 300Mhz Pentium® II with MMX™  
64MB SDRAM  
6.4GB Ultra ATA Hard Drive  
8MB Diamond Stealth II G460 Graphics Card  
32 Speed CD-ROM Drive  
Sound Blaster AWE 64 PnP  
300W Surround Speakers  
17" Colour Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
Windows 98 & IE 4.0  
Vet Anti-Virus

RentSmart for  
**\$117 p/m**  
36 month term

**\$2795**

SYADE011

### Power Advantage PII-333

Intel 333Mhz Pentium® II with MMX™  
64MB SDRAM  
6.4GB Ultra ATA Hard Drive  
8MB Diamond Stealth II G460 Graphics Card  
32 Speed CD-ROM Drive  
Sound Blaster AWE 64 PnP  
300W Surround Speakers  
17" Colour Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
Windows 98 & IE 4.0  
Vet Anti-Virus

RentSmart for  
**\$125 p/m**  
36 month term

**\$2995**

SYADE019

### Power Advantage PII-350

Intel 350Mhz Pentium® II with MMX™  
Intel BX 66/100MHz Chipset  
64MB PC-100MHz SDRAM  
8.4GB Ultra ATA Hard Drive  
8MB Millennium G200 128-bit  
32 Speed CD-ROM Drive  
Sound Blaster AWE 64 PnP  
300W Surround Speakers  
17" Colour Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
Windows 98 & IE 4.0  
Vet Anti-Virus

RentSmart for  
**\$137 p/m**  
36 month term

**\$3495**

SYADE024

### Power Advantage PII-400

Intel 400Mhz Pentium® II with MMX™  
Intel BX 66/100MHz Chipset  
64MB PC-100MHz SDRAM  
8.4GB Ultra ATA Hard Drive  
8MB Millennium G200 128-bit  
32 Speed CD-ROM Drive  
Sound Blaster AWE 64 PnP  
300W Surround Speakers  
17" Colour Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
Windows 98 & IE 4.0  
Vet Anti-Virus

RentSmart for  
**\$151 p/m**  
36 month term

**\$3845**

SYADE032

### Power Advantage PII-450

Intel 450Mhz Pentium® II with MMX™  
Intel BX 66/100MHz Chipset  
64MB PC-100MHz SDRAM  
8.4GB Ultra ATA Hard Drive  
8MB Millennium G200 128-bit  
32 Speed CD-ROM Drive  
Sound Blaster AWE 64 PnP  
300W Surround Speakers  
17" Colour Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
Windows 98 & IE 4.0  
Vet Anti-Virus

RentSmart for  
**\$165 p/m**  
36 month term

**\$4195**

SYADE037

### Advantage Server PII-400

Intel 400Mhz Pentium® II with MMX™  
Dual Processor BX Chipset  
128MB PC-100MHz SDRAM  
6.4GB Ultra SCSI Hard Drive  
2MB Virge DX Display Adaptor  
24 Speed SCSI CD-ROM Drive  
15" Colour Monitor  
MS Intellimouse and Pad  
104k Keyboard  
ADE ATX Case  
On Board Adaptec U/W SCSI Chipset

RentSmart for  
**\$151 p/m**  
36 month term

**\$3850**

SYADE014

Optional NT Server 4 OS **\$1095**



**KEEP YOUR  
MONEY.**



**SPREAD YOUR  
COSTS.**



**RENTALS ARE FULLY  
TAX DEDUCTIBLE.**



**GET MORE  
EQUIPMENT.**



**EASY 10 MINUTE  
APPROVAL.**

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

**1800 626 345 FREE CALL**

\*Please read our Terms and Conditions



Adelong Computers





# DTK Systems

As one of the world's largest manufacturers of computer systems and peripherals, DTK Computer has been providing award winning custom computer solutions for over 15 years. Success in this world wide market has come about through impressive quality and products that offer not only superior performance but excellent value.

## FortisPro



**2 YEAR  
WARRANTY**

### DTK Intel 233MMX

12.1" Active Colour TFT LCD  
Intel Pentium 233MHz CPU with MMX™  
Intel TX Chipset, 512KB Cache  
32MB RAM EDO  
3GB HDD  
ESS 1869 16-Bit Stereo, 3D Audio  
2MB EDO Video Ram  
89-Key Win95 Keyboard, Touchpad  
PCMCIA Port (1x Type III or 2x Type II)  
1xSerial, 1xParallel, 1xPS/2, 1xGame,  
1xTV OUT, 1xFir, 1xUSB, 1xExt Monitor Ports  
20x CD-ROM  
1.44MB FDD w/External Cable  
Li-Ion Battery  
AC/DC Adaptor, Carry Bag  
Windows 98

NBDTK001

**\$3395**

RentSmart for  
**\$30.69 P/W**  
36 month term

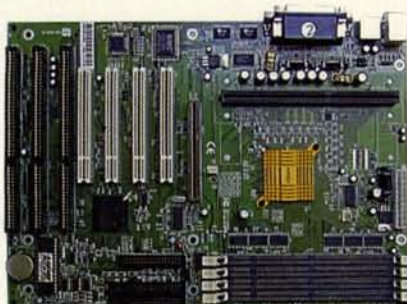
### DTK AMDK6- 300

12.1" Active Colour TFT LCD  
AMD K6-300MHz CPU with MMX™  
Intel TX Chipset, 512KB Cache  
32MB RAM EDO  
3GB HDD  
ESS 1869 16-Bit Stereo, 3D Audio  
2MB EDO Video Ram  
89-Key Win95 Keyboard, Touchpad  
PCMCIA Port (1x Type III or 2x Type II)  
1xSerial, 1xParallel, 1xPS/2, 1xGame,  
1xTV OUT, 1xFir, 1xUSB, 1xExt Monitor Ports  
20x CD-ROM  
1.44MB FDD w/External Cable  
Li-Ion Battery  
AC/DC Adaptor, Carry Bag  
Windows 98

NBDTK002

**\$3750**

RentSmart for  
**\$34.10 P/W**  
36 month term



### DTK Pentium II ATX Mainboard PRM-0080i

**System Processor:**  
Pentium II up to 450MHz  
ACPI / Ultra DMA 33 / AGP port  
Switching Voltage Regulator  
Support 4 DIMM (3.3v) up to 512MB  
4 PCI + 3 ISA + 1 AGP slot  
**ChipSet:**  
**Intel 82440BX**  
SMC 37C772

MBDTK008

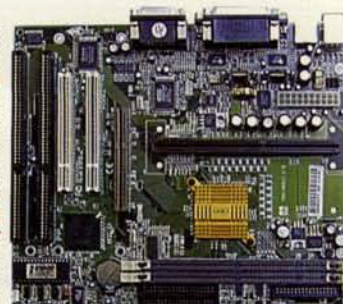
**\$279**

### DTK Pentium II Micro ATX Mainboard PRM-0082i

**System Processor:**  
Pentium II/Celeron up to 333MHz  
ACPI / Ultra DMA 33 / AGP port  
Switching Voltage Regulator  
Support 2 DIMM (3.3v) up to 512MB  
2 PCI + 2 ISA + 1 AGP slot  
**ChipSet:**  
**Intel 82440EX**  
ESS 1938 32 bit Audio

MBDTK010

**\$195**





# DTK Systems

**3 YEAR  
ON-SITE  
WARRANTY  
for all  
DTK systems**

## DTK APRI-80M/P350

- Intel Pentium II 350MHz
- Intel 440BX Chipset
- 64MB SDRAM
- 6.4GB Ultra ATA Hard Disk
- Intel i740 AGP 8MB
- 15" SVGA Monitor
- S3 Sonic PCI Sound
- 32 Speed CD-ROM
- 100W Amplified Speaker
- Mid-Tower Case
- Mouse/104 Keyboard
- MS Windows 98

SYDTK000 **\$2995**

RentSmart for \$27.23 P/W 36 month term



## DTK APRI-80M/P400

- Intel Pentium II 400MHz
- Intel 440BX Chipset
- 64MB SDRAM
- 6.4GB Ultra ATA Hard Disk
- Intel i740 AGP 8MB
- 17" SVGA Monitor
- S3 Sonic PCI Sound
- 32 Speed CD-ROM
- 100W Amplified Speaker
- Mid-Tower Case
- Mouse/104 Keyboard
- MS Windows 98

SYDTK001 **\$3695**

RentSmart for \$33.46P/W 36 month term

## DTK APRI-82/P300

- Intel Pentium II 300MHz
- Intel 440EX Chipset
- 64MB SDRAM
- 6.4GB Ultra ATA Hard Disk
- 4MB AGP Graphic Card
- 15" SVGA Monitor
- 16-bit 3D Sound Card
- 32 Speed CD-ROM
- 100W Amplified Speaker
- MicroATX Tower Case
- Mouse/104 Keyboard
- MS Windows 98

SYDTK002 **\$2350**

RentSmart for \$22.20P/W 36 month term



## DTK APRI-82/P333

- Intel Pentium II 333MHz
- Intel 440EX Chipset
- 64MB SDRAM
- 6.4GB Ultra ATA Hard Disk
- 4MB AGP Graphic Card
- 15" SVGA Monitor
- 16-bit 3D Sound Card
- 32 Speed CD-ROM
- 100W Amplified Speaker
- MicroATX Tower Case
- Mouse/104 Keyboard
- MS Windows 98

SYDTK003 **\$2650**

RentSmart for \$25.50P/W 36 month term

## DTK APRI-82/C266

- Intel Celeron 266MHz
- Intel 440EX Chipset
- 32MB SDRAM
- 4.3GB Ultra ATA Hard Disk
- 4MB AGP Graphic Card
- 15" SVGA Monitor
- 16-bit 3D Sound Card
- 32 Speed CD-ROM
- 100W Amplified Speaker
- MicroATX Tower Case
- Mouse/104 Keyboard
- MS Windows 98

SYDTK004 **\$1750**

RentSmart for \$19.10P/W 36 month term



## DTK APRI-82/C300

- Intel Celeron 300MHz
- Intel 440EX Chipset
- 32MB SDRAM
- 4.3GB Ultra ATA Hard Disk
- 4MB AGP Graphic Card
- 15" SVGA Monitor
- 16-bit 3D Sound Card
- 32 Speed CD-ROM
- 100W Amplified Speaker
- MicroATX Tower Case
- Mouse/104 Keyboard
- MS Windows 98

SYDTK005 **\$1895**

RentSmart for \$18.95P/W 36 month term

DTK offers the award winning APRI Series PC System, highly mobile Pentium notebooks, expandable Barebones, upgradable motherboards, and networking solutions. All of DTK's systems can be custom configured with a wide selection of quality, high-performing components and peripherals to build the ideal systems that deliver functionality and price/performance for the business networking environment or for the home office.

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

**1800 626 345** FREE CALL

\*Please read our Terms and Conditions



**Adelong Computers**





pentium

## Processors

Code	Model	Price
CPINT010	Pentium II 266	<b>\$399</b>
CPINT011	Pentium II 300	<b>\$505</b>
CPINT014	Pentium II 333	<b>\$750</b>
CPINT015	Pentium II 350	<b>\$975</b>
CPINT016	Pentium II 400	<b>\$1375</b>
CPINT017	Pentium II 450	<b>\$1545</b>
CPINT018	Celeron 266	<b>\$215</b>
CPINT019	Celeron 300	<b>\$275</b>

## AMD

Code	Model	Price
CPAMD004	AMD K6-233	<b>\$199</b>
CPAMD006	AMD K6-266	<b>\$248</b>
CPAMD007	AMD K6-300	<b>\$329</b>
CPAMD008	AMD K6-2 266	<b>\$315</b>
CPAMD009	AMD K6-2 300	<b>\$365</b>

## Cyrix

Code	Model	Price
CPIBM006	M2-233MHZ	<b>\$135</b>
CPIBM007	M2-266MHZ	<b>\$175</b>
CPIBM008	M2-300MHZ	<b>\$255</b>

## IDT

Code	Model	Price
CPIDT000	Winchip C6-225	<b>\$135</b>

## Memory

**EDO RAM** - For use in newer 486 systems and most Pentium / Pentium Pro style systems. Used in pairs in Pentiums & Pentium Pro's.

Code	Model	Price
RAGEN004	8MB EDO SIMM 72 Pin	<b>\$30</b>
RAGEN005	16MB EDO SIMM 72 Pin	<b>\$35</b>
RAGEN006	32MB EDO SIMM 72 Pin	<b>\$65</b>

**Parity RAM** - This error checking ram is used with older desktop systems and servers.

Code	Model	Price
RAGEN011	4MB SIMM 72 Pin	<b>\$45</b>
RAGEN012	8MB SIMM 72 Pin	<b>\$59</b>
RAGEN013	16MB SIMM 72 Pin	<b>\$80</b>

**SDRAM** - For use in current Pentium / Pentium II systems utilising Intel TX / LX / BX Chipsets. 100MHz for Intel BX Chipsets. Use individually. All SDRAM is 168 Pin.

Code	Model	Price
RAGEN008	32MB SDRAM	<b>\$65</b>
RAGEN009	64MB SDRAM	<b>\$169</b>
RAGEN021	128MB SDRAM	<b>\$325</b>
RAGEN022	64MB 100MHz SDRAM	<b>\$195</b>
RAGEN023	128MB 100MHz SDRAM	<b>\$375</b>

\* For use with BX Mainboards

**Fast Page RAM** - For use in older 486 & Pentium systems and some printers. Use in pairs in Pentiums.

Code	Model	Price
RAGEN001	8MB SIMM 72 Pin	<b>\$35</b>
RAGEN002	16MB SIMM 72 Pin	<b>\$55</b>
RAGEN003	32MB SIMM 72 Pin	<b>\$85</b>



## Hard Disks

### Quantum Fireball SE

Quantum is renowned for **quality** and **performance**. It has a fast average seek time - 9.5 milliseconds and internal data rates up to 158 megabyte per second at 5400 rpm. It also uses the Ultra ATA interface, with a data burst transfer rate of 33.3 megabytes per second. Furthermore the **Fireball SE is available in both IDE and SCSI models**.

#### IDE 3.5" - Fireball

Code	Model	GB	Cache	I'Face	Motor RPM	Price
HDQTM018	Fireball SE	3.2	128KB	UDMA	33MB/s	<b>\$295</b>
HDQTM028	Fireball EL	5.1	128KB	UDMA	33MB/s	<b>\$345</b>
HDQTM029	Fireball EL	7.6	128KB	UDMA	33MB/s	<b>\$545</b>
HDQTM030	Fireball EL	10.2	128KB	UDMA	33MB/s	<b>\$715</b>

#### SCSI 3.5" - Fireball SE Ultra SCSI

Code	Model	GB	Cache	I'Face	Motor RPM	Price
HDQTM023	Fireball SE	3.2	512KB	Ultra	20MB/s	<b>\$450</b>
HDQTM024	Fireball SE	4.3	512KB	Ultra	20MB/s	<b>\$565</b>
HDQTM025	Fireball SE	6.4	512KB	Ultra	20MB/s	<b>\$695</b>
HDQTM026	Fireball SE	8.4	512KB	Ultra	20MB/s	<b>\$899</b>

### Seagate SCSI

The Barracuda range of SCSI hard drives provide **unmatched performance and reliability** for workstations and file servers.

With **motor speeds of 7200 rpm** and **an average seek time of 8ms**, these drives are able to cater for the most demanding applications.

#### SCSI 3.5" - Seagate Barracuda

Code	Model	GB	Cache	I'Face	Motor RPM	Price
HDSGT011	Barracuda 4XL	4.5	512KB	Ultra	20MB/s	<b>\$1095</b>
HDSGT012	Barracuda 4XL	4.5	512KB	U/W	40MB/s	<b>\$1155</b>
HDSGT013	Barracuda 9	9.1	512KB	Ultra	20MB/s	<b>\$1495</b>
HDSGT014	Barracuda 9	9.1	512KB	U/W	40MB/s	<b>\$1495</b>

### IBM

IBM maintains a commitment to **innovation, reliability, and customer value**.

- The Deskstar incl. an Ultra DMA/33 interface.
- IBM's Ultrastar combines **fast rotational latency** and **rapid seek times** with a new custom controller that incorporates command queueing.

#### IBM Ultra DMA33 - DESKSTAR HERCULES

Code	Model	GB	Cache	I'Face	Motor RPM	Price
HDIBM006	DHEA 34331	4.3	512KB	UDMA	5400	<b>\$359</b>
HDIBM007	DHEA 36480	6.4	512KB	UDMA	5400	<b>\$415</b>
HDIBM008	DHEA 38451	8.4	512KB	UDMA	5400	<b>\$545</b>

#### IBM SCSI - ULTRASTAR 9ES DRACO

Code	Model	GB	Cache	I'Face	Motor RPM	Price
HDIBM009	DDRS 34560-50	4.5	512KB	Ultra	7200	<b>\$655</b>
HDIBM010	DDRS 34560-68	4.5	512KB	U/W	7200	<b>\$695</b>
HDIBM011	DDRS 39130-50	9.1	512KB	Ultra	7200	<b>\$1210</b>
HDIBM012	DDRS 39130-68	9.1	512KB	U/W	7200	<b>\$1265</b>

**new**



# Processors

# AMD



Adelony Computers

**Experience the New Reality with the AMD-K6®-2 Processor**

## AMD-K6-2 PROCESSOR - WITH 3DNow!™ TECHNOLOGY



- Leading-Edge Performance
- Lifelike Images and Graphics
- Big-Screen Sound & Video
- Ultimate Internet Experience

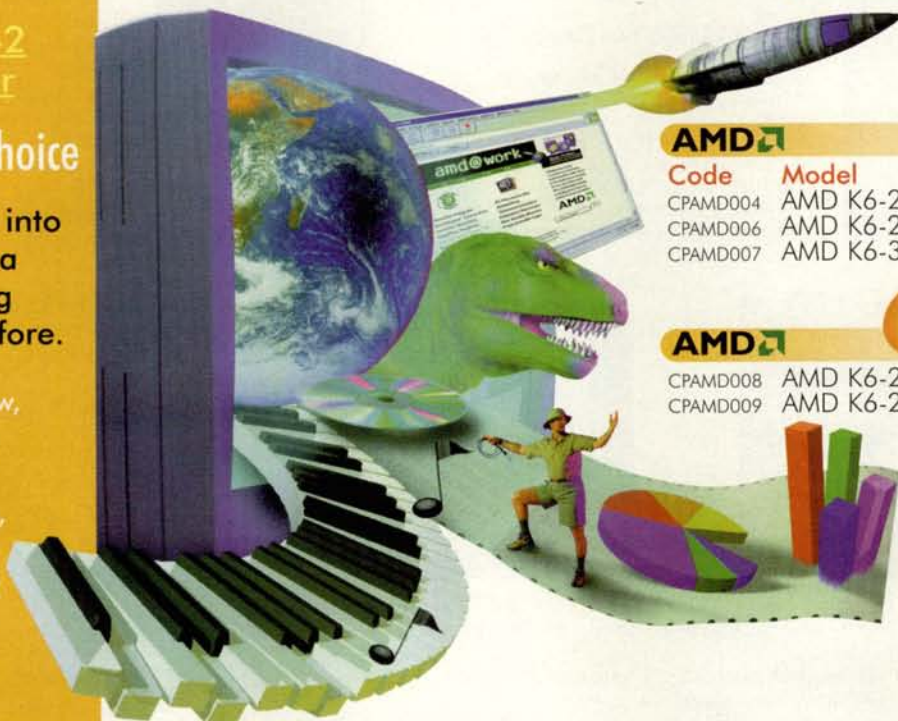


### AMD-K6-2 Processor

### The Smart Choice

PC users are into multimedia computing like never before.

With the new, innovative 3DNow!™ technology, the AMD-K6-2 processor delivers better overall performance\* and a superior experience for Windows® computing.

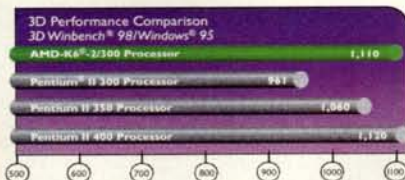


Code	Model	Price
CPAMD004	AMD K6-233	<b>\$199</b>
CPAMD006	AMD K6-266	<b>\$248</b>
CPAMD007	AMD K6-300	<b>\$329</b>

**new**



CPAMD008	AMD K6-2 266	<b>\$315</b>
CPAMD009	AMD K6-2 300	<b>\$365</b>



The AMD-K6-2 processor brings leading-edge multimedia computing to the mainstream. With the AMD-K6-2 processor, PC users get the ultimate in 3D realism and performance-for a realistic price.

### Home Advantage 266

AMD-K6™ 266MHz with MMX  
32MB SDRAM  
3.2GB Ultra ATA Hard Disk  
24/32 Speed CD-ROM Drive  
PCI 3D Sound Card  
100W Amplified Speakers  
4MB Virge 3D Graphics Accelerator  
15" Colour Monitor  
Logitech Mouse & Pad  
104 Key Windows Keyboard  
ADE Minitower Case  
Microsoft Windows 98

RentSmart for  
**\$16.62 p/w**  
36 month term

**\$1495** SYADE030

### Power Advantage 300 - with 3DNow!™

AMD-K6-2/300 - with 3DNow! Technology  
64MB SDRAM  
4.3GB Ultra ATA Hard Disk  
24/32 Speed CD-ROM Drive  
PCI 3D Sound Card  
300 Watt Speakers  
4MB AGP Graphics Card  
17" Colour Monitor  
Mouse & Pad  
104 Key Windows Keyboard  
ADE Minitower Case  
Microsoft Windows 98

RentSmart for  
**\$21.23 p/w**  
36 month term

**\$2195** SYADE036



Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

\*Please read our Terms and Conditions

**1800 626 345** FREE CALL



In a continuing campaign to give it's customers more and more value for their money, CHAINTech is bundling a total virus protection solution with their mainboards, absolutely free of charge.

The 100% virus protection solution consists of a unique bootsector protection program which is built-in to the mainboard's BIOS, called ChipAway Virus, and the award winning PC-Cillin v3.0 (OEM version) virus protection program.

**\$275**

MBCHA003



### CHAINTech 6BTM

#### System Processor:

- Supports up to 450MHz Intel Pentium II processors
- Slot 1 CPU socket with retention mechanism
- Supports 66/100MHz system clock speeds
- Innovative CPU technology (simple CPU installation via BIOS)

#### ChipSet:

- Intel 82440BX two chip PCSet

#### Bios:

- Award System BIOS with PnP, APM, DMI, CPU throttling and Multi-device booting features

#### Ultra DMA-33 IDE Ports:

- Supports up to PIO Mode 4, Multi-word DMA Mode 2 and Ultra DMA-33 timings
- Bus Mastering software drivers for all well-known multi-task operating systems.

**\$210**

MBCHA001



### CHAINTech 6LTM2

#### System Processor:

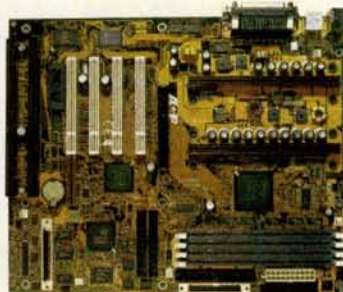
- Supports up to 333MHz Intel Pentium II processors
- Slot 1 CPU socket with retention mechanism Supports 60/66 Mhz system clock speeds
- Innovative SeePU technology (Jumper free CPU installation via BIOS)

#### ChipSet:

- Intel 82440LX two chip PCSet
- AGP (Accelerated Graphics Port) Slot
- DRAM Memory Supports up to 384Mb EDO and Synchronous DRAM modules

#### PCI IDE:

- Supports up to PIO Mode 4, Multiword Mode 2 and Ultra DMA-33



### CHAINTech 6BDU

**System Processor** Supports up to two 450MHz Intel Pentium® II processors

- Slot 1 CPU socket with retention mechanism
- Supports 66/100 MHz system clock speeds
- Innovative SEEPU technology (simple CPU installation via BIOS)

**ChipSet Intel 82440BX** two chip PCSet Accelerated Graphics Port (AGP)

#### DRAM Memory

- Supports up to 512MB EDO and Synchronous DRAM modules
- Provides single-bit ECC capability

#### Two Ultra DMA-33 IDE Ports

- Supports up to PIO Mode 4, Multiword Mode 2 and Ultra DMA33 timings
- Bus Mastering software drivers for all well-known multi-task operating systems

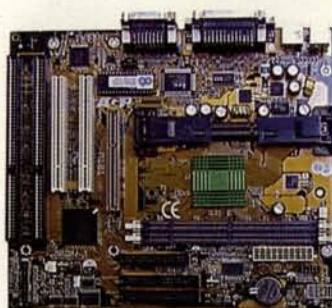
#### Ultra2 SCSI with RAIDport III On Board

- AIC 7890 SCSI controller and AIC-3860 chip, supports up to 80Mbps(Ultra2 SCSI)
- Supports Adaptec ARO-1130CA-C RAID card for RAID system upgradability

#### ATX Form

MBCHA004

**\$649**



### CHAINTech 6ESA

**System Processor** Supports up to 333MHz Intel Pentium® II & Celeron® processors

- Slot 1 CPU socket with low cost retention mechanism
- Supports 60/66 MHz system clock speeds
- Innovative SEEPU technology (simple CPU installation via BIOS)

**ChipSet Intel 82440EX** two chip PCSet

#### Accelerated Graphics Port (AGP)

#### DRAM Memory

- Two 168-pin DIMM sockets support up to 256MB EDO and Synchronous DRAM
- Provides single-bit ECC capability

#### Two Ultra DMA-33 IDE Ports

- Supports up to PIO Mode 4, Multiword Mode 2 and Ultra DMA33 timings
- Bus Mastering software drivers for all well-known multi-task operating systems

#### Audio Subsystem

- Yamaha SA3 16-bit stereo audio controller
- Programmable sample rates from 5.5KHz to 48KHz for record and playback with full-duplex DSVS capability
- Supports DLS(Downable Wavetable Sounds) wavetable synthesiser with limitless varieties of instrument samples using system DRAM

#### Micro-ATX Form

MBCHA005

**\$199**



new

AMD-K6-2 compatible

### CHAINTech 5AGM2

**System Processor** Supports up to 233MHz Pentium processors with MMX™ technology

- Supports Intel Pentium OverDrive processors (P54CTB)
- Supports PR120+-PR200+Cyrix/IBM 6x86™ (processor rev. 2.7 or later)/6x86L™ processors and PR166+-PR266+-6x86MX and MII-300 processors
- Supports 166-300MHz K6™ and K6-2™ processors
- Supports 180-200MHz IDT WinChip MMX processors
- High-efficiency Switching Power module
- Supports 60/66/100 MHz system clock speeds
- Supports 2.0-3.5v CPU core voltage

**ChipSet VIA MVP3** (82C598AT/82C586) two chip AGPset

#### Accelerated Graphics Port (AGP)

**L2 Cache** 512KB built-in Pipeline Burst SRAM

#### DRAM Memory

- Three 168-pin 3.3v unbuffered DIMM sockets support up to 256MB FP, EDO, Synchronous DRAM modules

#### Two Ultra DMA-33 IDE Ports

- Supports up to PIO Mode 4, Multiword DMA Mode 2 and Ultra DMA33 timings
- Bus Mastering software drivers for all well-known multi-task operating systems

MBCHA006

**\$155**

Two USB Ports On Board / FCC Class B & CE EMI Regulation Compliant

**INTERNET WEB SITE:**  
<http://www.adelong.com.au>  
**e.mail:** [info@adelong.com.au](mailto:info@adelong.com.au)

**HEAD OFFICE & SERVICE**  
45-47 Ralph Street  
Alexandria NSW 2015  
Ph: (02) 9669 3188  
Fax: (02) 9669 3216  
Call for new showroom

**CITY OFFICE**  
127 York Street  
Sydney NSW 2000  
Ph: (02) 9267 5272  
Fax: (02) 9267 5042



# Laptops

# TOSHIBA



Adelung Computers

## Libretto 100CT

- Pentium 166MHz with MMX
- 7.1" 640x480 TFT Screen
- 32MB EDO RAM
- 2GB HDD
- 1 x Type II PC Card Slot
- FDD
- 1 Year RTB Warranty

**\$3750** NBTS016

The Smallest, lightest Windows 95 PC the Libretto offers unprecedented, fully compatible portability at home or in the office.



## Satellite 320CDS

- Intel Pentium 233MHz with MMX technology
- 32MB expandable to 160MB EDO
- 3.8GB EIDE HDD
- Internal Max20x-speed CD-ROM
- 12.1" DSTN display at 800x600 resolution
- Two inbuilt stereo speakers
- Windows 98
- 3 Years RTB Warranty

**\$Call**



## Satellite 330CDT

- Intel Pentium 266MHz with MMX technology
- 32MB expandable to 160MB EDO
- 3.8GB EIDE HDD
- Internal Max20x-speed CD-ROM
- 12.1" active matrix TFT display at 800x600 resolution
- Two inbuilt stereo speakers
- Windows 98
- 3 Years RTB Warranty

**\$Call**

Affordable combination of price, performance & value.

TOSHIBA FRIEND

## Tecra 8000 Series

- Intel Mobile Pentium II 233MHz or 266MHz
- 32MB or 64MB expandable to 256MB
- Internal 3.8, 6, or 7.6GB EIDE HDD
- SelectBay™ Hot Swap support for optional devices, CD-ROM, DVD-ROM, Second Hard Disk, Secondary Battery or Diskette Drive
- 12.1", 13.3", 14.1" active matrix TFT display
- Windows 98
- 3 Years RTB Warranty

## Call for Details

Revolutionary new notebook series for business & corporate customers wanting the ultimate in performance.



## Portege 7000

- Intel Mobile Pentium II 266MHz
- 32MB expandable to 160MB SDRAM
- 3.8GB EIDE HDD
- 12.1" active matrix TFT display at 800x600 resolution
- Inbuilt speaker & microphone
- External diskette drive
- Windows 98
- 3 Years RTB Warranty

**\$Call**

These advanced ultraportables combine exceptional power, performance.



# My oRiS

Introducing a new range of laptop computers from

utilising state-of-the-art technology for portability & convenience

## Heuristic Power Management

State-of-the-art technology to maximise the life in your notebook battery. It learns the way the user uses the notebook.

So, as the user changes from one task to another the HPM watches and learns, maximising the battery life for the user automatically.



## MINUET

- AMD 300MHz CPU
- 512K Cache
- 32MB RAM
- 3GB Hard Disk
- 24 Spin CD-ROM
- Li-Ion Battery
- Windows 98
- 12.1" DSTN
- 12.1" TFT
- 13.1" TFT

300MHz with HPM Heuristic Power Management

**\$3490** NBORI000  
**\$3990** NBORI001  
**\$4850** NBORI002

## SONATA

- Intel Pentium 233MMX
- 512K Cache
- 32MB RAM
- 1GB Hard Disk
- 24 Spin CD-ROM
- Ni-Mh Battery
- Windows 98
- 12.1" TFT

**\$3395** NBORI003



**Free** 2nd Battery

2 Year Australia Wide Warranty - Parts & Labour

# Multimedia



## Viper V330

- DCDIA006 **\$295** PCI
- DCDIA007 **\$235** AGP (OEM)
- Based on the NVIDIA 128 chipset, this card has super fast 2D/3D
- 128bit processing and 4Mb of SG-Ram, this is the fastest PCI card around.
- Comes in either PCI or AGP configurations.



## Stealth II G460

- Taking full advantage of the AGP port, this card has the 64bit Intel i740 chip.
- Using 8Mb of SD-Ram and a fast 203Mhz
- RAMDAC, the G460 has excellent performance and great picture quality

DCDIA014



## Sonic Impact S70

- PCI Audio Card at an amazing price.
- Advanced Hardware Wavetable with a high quality 64-voice hardware wavetable synthesiser.

MMDIA005

## Monster 3D II

- MMDIA003 **\$495** (8MB)
- MMDIA007 **\$595** (12MB)
- Featuring the 3Dfx Voodoo2 chipset for amazing 3D performance.
- Used in conjunction with your existing video card, the Monster II will provide an unparalleled gaming experience.

## Monster Sound M80

- Monster Sound M80 has you surrounded with true positional 3D audio.
- PCI Audio Wickedly Boosts PC Performance
- Sound Blaster Pro Compatible

MMDIA004

## Monster Sound MX200

- Delivers up to 8 hardware accelerated 3D audio streams. 4Mb of Rom On board.
- 64-voice Hardware Wavetable, Quad
- Speaker Support, Gold Plated Connectors

MMDIA006



Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

\*Please read our Terms and Conditions

**1800 626 345 FREE CALL**



## 3D & Sound Cards



**\$120**  
MMORC002



### NuSound 3D

*The Ultimate in digital sound for Realistic 3D gaming!*

#### Features:

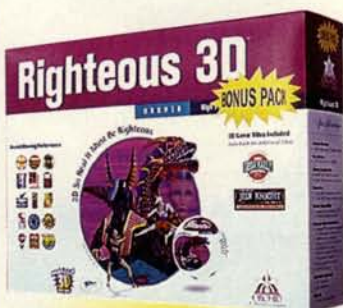
Aureal 3D audio that creates highly realistic and immersive 3D sounds the way they are in the real world. It will convince you that **sounds are above, behind and all around you.**

#### Advanced Features:

- Aureal Vortex AU8820 digital audio processor
- PCI BUS master with 18-channel DMA Interface
- Professional studio quality 64-voice wavetable synthesis
- Legacy DOS mode compatibility in Windows as well as Real Mode DOS
- Analog/digital gameport and MPU-401 UART

#### BONUS Exciting A3D games include:

- Jedi Knight • Ambush at Altir 5 by LucasARTS Entertainment
- Shipwreckers by Psynosis • NuSound 3



**\$199**  
MMORC000



Award  
Winning  
Performance

### Righteous 3D - Bonus Pack!

*The ultimate 3D accelerator for 3D games.*

**3D so real it must be Righteous!**

**Award winning performance!**

Whether you're into serious flight sims or hard core mutant blasting, brace yourself for arcade action with Righteous 3D. Based on 3Dfx Interactive Voodoo Graphics, Righteous 3D delivers some of the same 3D capabilities found in arcade systems.

- Advanced filtering and anti-aliasing techniques produce smooth textured images.
- High precision 3D accuracy generates realistic three dimensional objects.
- Transparent and translucent effects like fog, smoke and haze create stunning atmospheric conditions.

**Images are sharp, clear and realistic.**

#### BONUS Exciting 3D games include:

- Sega Rally Championship - NEW by Sega PC • Jedi Knight: Pathway to the Force - NEW by LucasArts Entertainment Company • MechWarrior 2 with NetMech by Activision • G-Police by Psynosis • Shadowmaster by Psynosis • Overboard by Psynosis • Scorched Planet - trial version by Criterion studios • Hellbender - Trial version by Microsoft



**\$495**  
MMORC003 (8MB)

**\$569**  
MMORC001 (12MB)



### Righteous 3D II 12MB

*High performance Voodoo 2 3D accelerator!*

Righteous 3D II is a dedicated 3D accelerator that delivers arcade quality 3D graphics acceleration. It has full motion frame rate performance with all 3D features simultaneously accelerated.

#### Features:

8MB or 12MB EDO DRAM configurations with triple 64-bit memory architecture. Supports 3D game resolutions of up to 800 x 600 with Z-buffering and up to 1024 x 768 without Z-buffering Windows 95 Direct3D support.

Righteous 3D II is a dedicated 3D accelerator that works transparently with your 2D adaptor to render complex three dimensional environments in real-time.

**Righteous 3D II supports a wide range of today's leading 3D standards** including Windows 95 Direct3D. It comes bundled with:

- Battlezone by Activision
- Jedi Knight™: Ambush at Altir 5™ by LucasArts Entertainment Company
- Incoming by Rage Software
- G-Police by Psynosis
- Final Reality™-3D Benchmark Utility by Remedy Entertainment & VNU European Labs.



## Millennium G200

"...the Matrox G200 gets the nod as the fastest 2D/3D card around."

PC Magazine August 98

PC  
MAGAZINE  
AUSTRALIA  
EDITORS'  
CHOICE

Superior acceleration  
for professional 2D/3D graphics

The new Millennium G200 from Matrox introduces a new standard in business graphics. This video card delivers uncompromisingly high performance in 2D, 3D, and video without sacrificing the display quality and driver reliability that are so important to professional users.

Featuring the new MGA-G200 128-bit DualBus graphics chip, the Millennium G200 exceeds Matrox's previous record in leading 2D performance, and brings new levels of 3D acceleration and video playback to the PC.



- High performance video card with full AGP 2X support
- Advanced 2D, 3D, and software DVD video acceleration
- High quality 3D rendering engine
- New MGA-G200 128-bit DualBus graphics chip
- 8MB of graphics memory upgradeable to 16MB
- High speed 250MHz RAMDAC
- Fully multimedia upgradeable



**\$330** (8MB)  
DCMAT023

**Stunning 2D, Killer 3D, Next Generation Video ALL IN ONE CARD**

2D WinBench 98 High End: 1280 x 1024

Matrox Millennium G200 @ 24-bit	252
99 Revolution 3D @ 16-bit	236
Diamond FireGL 1000 Pro @ 16-bit	215
ATI XPERT@Work @ 16-bit	177

3D WinBench 98: 640 x 480

Matrox Millennium G200	840
Diamond Viper V330	809
ATI XPERT@Work	641
Diamond FireGL 1000 Pro	501

Millennium G200 is faster in 24-bit colour than the competition is at 16-bit

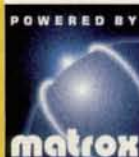


## Productiva G100

Acceleration for demanding business graphics

**Features:** • 64-bit AGP-ATX graphics card

- 4 MB or 8MB of powerful graphics memory
- High performance 2D business productivity
- 1600 x 1200 desktop in true colour for demanding business documents
- 230 MHz RAMDAC for flicker-free displays
- Support for 3D and video-based business applications
- Fully multimedia upgradeable



**\$145** (4MB)  
**\$199** (8MB)  
DCMAT020  
DCMAT021

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

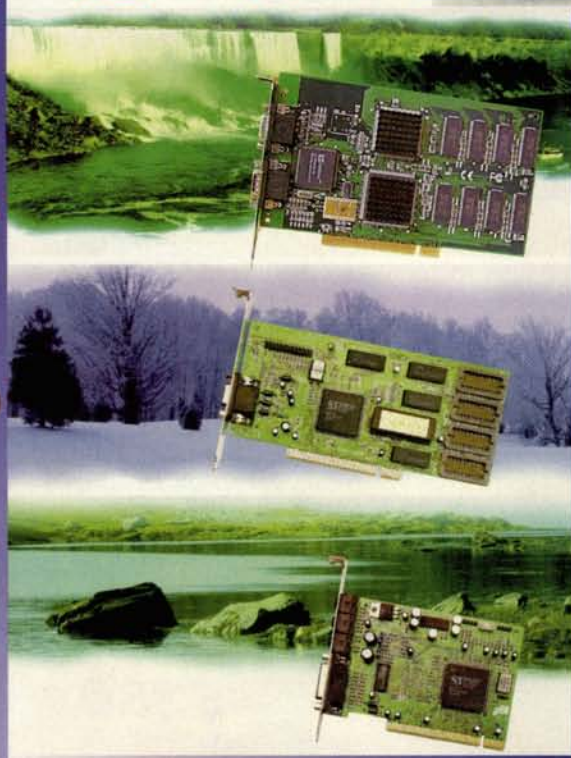
**1800 626 345** **FREE CALL**

\*Please read our Terms and Conditions





# Generic, 3D & Sound Cards



## 3D FX VOODOO 3D Accelerator

...for 3D graphic enhancement!

### Features:

- High Performance 4MB card utilising industry leading 3DFX Voodoo Chipset
- Unrivalled games performance with electrifying frame rates
- Works with any conventional 2D card

DCEAG002

**\$150**



## S3 Virge Hardware 3D VGA Card

...great as an interface between the monitor and the computer!

### Features:

- High performance DRAM base 64 bit 2D/3D graphics engine
- Unique S3 Streams Processor for high quality performance
- DPMS 2.0 standard green PC power saving feature
- High quality/perf. 3D texture mapping
- Z Buffering for 3D video

DCEAG001

**\$53** (2MB)

DCEAG001

**\$66** (4MB)



## ES1938 (SOLO-1) PCI Sound Card

...lifting your system to new heights!

### Features:

- Single, high-performance, mixed-signal, 16-bit stereo VLSI chip
- PCI parallel bus interface, version 2.1
- High-Quality ESFM music synthesiser/dynamic range (SNR) over 80 dB
- Integrated Spatialiser 3D audio effects processors
- Full-Duplex operation for simultaneous record and playback
- Supports PC games/MSWin Sound Sys./Software Wavetable
- Meets PC 97/PC 98 and WHQL specifications

MMRAG001

**\$39**

## Audio & Visual

### miro Cards

Code	Model
MMMI000	Miro PCTV
MMMI001	Miro DC10 PCI Media Studio 2.5
MMMI004	Miro DC20 plus PCI Media Studio 5
MMMI002	Miro DC30 plus
MMMI003	Miro DV 300

### Generic Sound Cards

Code	Model
MMGEN005	Generic 16-Bit PnP Sound Card
MMGEN019	Generic S3 PCI Sound Card

### Price

<b>\$255</b>
<b>\$675</b>
<b>\$1150</b>
<b>\$2095</b>
<b>\$1725</b>

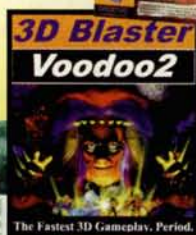
### Generic Display Cards

Code	Model	Price
DCGEN000	1 MB ISA SVGA card	<b>\$49</b>
DCGEN001	1 MB S3 PCI SVGA card (upgr. to 2Mb)	<b>\$40</b>
DCGEN003	1MB EDO upgrade for S3	<b>\$20</b>
DCGEN008	2MB S3 Virge 3D PCI	<b>\$75</b>
DCGEN011	4MB 3D AGP Graphics Card	<b>\$85</b>
DCGEN012	8MB i740 AGP Graphics Card	<b>\$165</b>

### Price

<b>\$35</b>
<b>\$65</b>

CREATIVE



Code	Model
MMCRE011	Sound Blaster™ AWE64 Value
MMCRE012	Sound Blaster™ AWE64 Gold
MMCRE026	Sound Blaster™ Ensonique PCI
MMCRE013	Sound Blaster™ 16

### Price

<b>\$155</b>
<b>\$440</b>
<b>\$115</b>
<b>\$75</b>

## Multimedia

3D Blaster Voodoo 2 8M MMCRE023 **\$485**

3D Blaster Voodoo 2 12M MMCRE024 **\$575**

- 3 TIMES FASTER THAN THE ORIGINAL VOODOO GRAPHICS CHIPSET.
- 12MB FOR MAXIMUM PERFORMANCE.
- THREE DEDICATED 3D ENGINES FOR EXPLOSIVE ACTION AT 60 FRAMES PER SECOND.

PC-DVD Encore Dxr2 MMCRE016 **\$555**

- DVD Player for TV & DVD Player for PC
- 20x Speed CD-ROM Drive
- 2nd Generation DVD-ROM Drive
- Video CD (H/W MPEG-1) Player
- Dxr2 Technology
- Dolby Digital (AC-3) Audio



Sound Blaster™ PCI64 MMCRE025 **\$235**

- Synthesis engine provides 64 voices of great wave-table msounds
- Support for Microsoft® DirectSound® and DirectSound 3D™ and derivatives audio technology in 2- and 4-speaker mode
- Utilises system RAM for wave-table synthesis, full-duplex support.



# Backups & Media

## Backup Devices

### SONY 3.5" DAT SCSI DRIVES

Code	Model	Price
BUSON000	SONY SDT4000 2/4GB INT DDS-1	\$1198
BUSON001	SONY SDT5000 4/8GB INT DDS-2	\$1375
BUSON003	SONY SDT5000 4/8GB EXT DDS-2	\$1650

### IOmega

Code	Model	Price
BUIOM004	JAZ DRIVE (SCSI INT.) - 1.0GB	\$545
BUIOM003	JAZ DRIVE (SCSI EXT.) - 1.0GB	\$595
BUIOM017	JAZ 2GB DRIVE (SCSI INT.)	\$1050
BUIOM018	JAZ 2GB DRIVE (SCSI EXT.)	\$1050
BUIOM000	ZIP DRIVE EXT. (PARALLEL PORT) - 100MB	\$275
BUIOM001	ZIP DRIVE EXT. (SCSI PORT) - 100MB	\$275
BUIOM007	100MB ZIP INT IDE	\$173
BUIOM011	ZIP PLUS	\$375
BUIOM010	ZIP DISK MAC	\$25
BUIOM012	ZIP DISK PC	\$25
BUIOM020	JAZ MEDIA 1GB PC DISK (1 PER PACK)	\$170
BUIOM019	JAZ MEDIA 2GB PC DISKS (1 PER PACK)	\$205
BUIOM013	IOmega JAZ TRAVELLER	\$75
BUIOM014	ZIP DRIVE CARRY CASE	\$25

## Media

Code	Model	Price
BUGEN000	QIC80 DC2120 120MB/250MB COMP	\$39
BUGEN001	QIC-3020 MC300XL 680MB/1.36GB COMP	\$45
BUGEN002	QIC-WIDE 520 200MB/400MB COMP	\$45
BUGEN003	TRAVAN TR-1 400MB/800MB COMP	\$45
BUGEN004	TRAVAN TR-2 800MB/1.6GB COMP	\$45
BUGEN005	TRAVAN TR-3 1.6GB/3.2GB COMP	\$59
BUGEN006	TRAVAN TR-4 4GB/8GB COMP	\$69
BUGEN007	4MM DAT DDS-1 90M 2GB/4GB COMP	\$15
BUGEN008	4MM DAT DDS-2 120M 4GB/8GB COMP	\$25
BUGEN009	4MM DAT DDS-3 125M 12GB/24GB COMP	\$65



# Cases & Power Supplies

## ADE Generic Cases

Code	Model	Dimensions (W x D x H)	Price
CAADE000	ADE MINITOWER CASE	180mm x 415mm x 332mm	\$50
CAADE001	ADE DESKTOP CASE	491mm x 401mm x 147mm	\$50
CAADE002	ADE MIDITOWER CASE	180mm x 405mm x 380mm	\$75
CAADE011	ADE FULL TOWER ATX 300W	192mm x 427mm x 580mm	\$203

## Miscellaneous Cases

Code	Model	Dimensions (W x D x H)	Price
CAADE007	Ext. HDD SCSI Case	216mm x 81mm x 63mm	\$138
CAADE008	Ext. 5.25" IDE CD-ROM Case	203mm x 256mm x 74mm	\$138
DSADE024	EH-132, Portable 3.5" HD caddy which plugs straight into the parallel port of your computer. 40MB - 8.4GB limit.		\$165
DSADE025	EH-100, Portable 3.5" / 2.5" HD caddy which plugs straight into the parallel port of your computer. 40MB - 8.4GB limit.		\$145

\*ALL Cases include Power Supplies

## Power Supplies

Code	Model	Price
PSGEN000	200W POWER SUPPLY	\$35
PSGEN001	300W POWER SUPPLY	\$99
PSGEN002	200W ATX POWER	\$55
PSGEN003	300W ATX POWER	\$99

## UPS Power Supplies

Code	Model	Price
PSAPC000	APC BACK-UPS 500	\$289
PSAPC001	APC BACK-UPS PRO 420	\$395
PSAPC002	APC BACK-UPS PRO 650	\$530
PSAPC003	APC SMART-UPS 700	\$795

## Removable HDD Racks

Code	Model	Price
MSADE000	IDE Removable HDD Rack	\$25
MSADE001	SCSI Removable HDD Rack	\$30

## ADE DELUXE MINI-TOWER CASE

W: 172mm  
D: 423mm  
H: 347mm

CAADE010 **\$85**



## ADE DELUXE AT/ATX MID CASE

W: 192mm  
D: 430mm  
H: 540mm

CAADE004 **\$155**



## ADE DELUXE AT/ATX MID CASE

W: 190mm  
D: 425mm  
H: 475mm

CAADE009 **\$135**



## ADE DELUXE AT/ATX DESKTOP CASE

W: 442mm  
D: 473mm  
H: 155mm

CAADE012 **\$135**



# Scanners / Input Devices

## Keyboards

Code	Model	Price
IOGEN000	ENHANCED 104/WIN95	\$25
IOGEN001	HONEYWELL GENUINE - 104/WIN95	\$45
IOGEN010	GENERIC PS/2 Keyboard	\$35

## Mice

Code	Model	Price
IOGEN004	GENERIC 3 BUTTON MOUSE	\$10
IOGEN003	MICROSOFT INTELLI-MOUSE	\$90
IOGEN004	GENIUS 3 BUTTON MOUSE - SER./PS2	\$25

## Acerscan

Code	Model	Price
IOACE003	ACERSCAN 310 24 BIT-4800dpi	\$198
IOACE004	ACERSCAN 610 PLUS 30 BIT-9600dpi	\$310

## Scanners

### Hewlett Packard 5100

• 1200x1200dpi, 300dpi, 24-bit colour, 8-bit grayscale.  
• Incl. Visioneer PaperPort V3.0 software.

IOHPD001 **\$465**

IOHPD012 5100 with Adobe Photoshop 4.0 **\$635**

IOHPD013 5100 with Omnipage Pro **\$695**

### Hewlett Packard 6100C

• 2400x2400dpi, 600dpi, 30-bit colour, 10-bit grayscale.

• 35mm HP ScanJet Slide Adaptor.

• Incl. DeskScan II scanning software, or from within software using TWAIN or OLE.

IOHPD011 **\$1169**



Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



**1800 626 345** FREE CALL  
RESELLER ENQUIRIES WELCOME \*Please read our Terms and Conditions



Adelony Computers



## Modems

### Forever Fast

- The Wave SP 56 supports both V.90 and K56flex standards to ensure you have no disruptions to your 56K modem connections.
- This allows the modem to dial into a K56flex-based ISP now and automatically switch to V.90 when the ISP upgrades, making the transition to V.90 hassle-free.
- And as the Wave SP 56 is Flash-upgradeable, this ensures that future enhancements to V.90 can be quickly flash downloaded online-guaranteeing your Wave SP 56 stays Forever Fast.



**\$269**  
FMBAN003



### Bonus CD-ROM

The bonus CD-ROM is packed full of useful software

### Fax From Your Computer

The fax software enables you to send and receive faxes from any Windows application.

### Simultaneous Voice & Data

Simultaneous Voice & Data (SVD) is a great tool for tele-conferencing.



- Full Duplex Speakerphone.
- The Wave's full duplex speakerphone allows you to use your PC just like a hands-free telephone.
- Smart answerphone with multiple voicemail boxes.

## NetComm Roadster II 56 ULTRA SVD...

**\$270**  
FMNET012



The modem that can see, speak, listen & read!

- Supports V.90 Technology
- Ultimate High speed 56Kbps download
- Voice, data and fax modem
- Simultaneous Voice and Data - includes headset
- Operates as a handsfree speakerphone, with or without headset
- Maximum throughput of 230,400bps
- Send and receive faxes at 14.4Kbps
- Built-in error correction
- Lifetime warranty
- Free lifetime customer support



Code	Model	Price
FMNET007	InPlus 56K SVD Int.	\$230
FMNET012	Roadster II 56K Ultra SVD Ext.	\$270
FMNET013	PCMCIA CardModem 56K	\$365
FMNET008	PCMCIA CardModem 56K + Eth.	\$500

**INTERNET WEB SITE:**  
<http://www.adelong.com.au>  
**e.mail:** [info@adelong.com.au](mailto:info@adelong.com.au)

HEAD OFFICE & SERVICE  
45-47 Ralph Street  
Alexandria NSW 2015  
Ph: (02) 9669 3188  
Fax: (02) 9669 3216  
Call for new showroom

CITY OFFICE  
127 York Street  
Sydney NSW 2000  
Ph: (02) 9267 5272  
Fax: (02) 9267 5042



# Modems

**US Robotics®**



Adelung Computers

## 56K Global Modem PC Card

This innovative 56 Kbps Global PC Card modem is easily configured for use worldwide and features x2 technology for high-speed downloads over standard phone lines.

Connect easily to phone lines with the included cable connector. Insert your cable into the modem & then when travelling attach an adaptor for the country you are visiting; plug into a phone jack & you're ready to fax or access data from anywhere in the world.

### Features:

- Real-time access and 56 Kbps downloads - faster than 28.8Kbps modems
- x2 Technology: Faster downloads with higher throughput
- World Ready: Access in more than 250 countries/regions
  - Flash DSP
  - Flash ROM
- Guaranteed Compatibility
- Intelligent Auto Install: Easy installation in minutes

**\$365**

FMROB009



## Sportster Flash 56Kbps

The world's undisputed leader in high speed modems. Internet access couldn't be faster or easier with your "x2 Technology" Sportster Faxmodem.

The new x2 Technology allows you to download information from the internet at up to 56Kbps. It's also compatible with other modems from 33.6Kbps down to 300bps.

### Features:

- x2 Technology: Download from the Internet at 56Kbps
- Compatible with other modems at up to 33.6Kbps
- Flash Memory Upgradeable
- Send and receive faxes directly from your PC
- Remote fax retrieval
- Mailbox security
- Fax/data software

**\$230**

FMROB006



## Courier Modem

Dual Standard V.34 Fax with V.32 bis. Courier is compatible with all popular protocols and ITU-T standards.

It automatically detects and connects at the fastest available speed.

Fast Faxing is achieved:

V.17 at 14.4 Kbps, Group III, Class I & 2.0 with call detection.

### Features:

- Flash ROM Upgradeable: Designed with extra processing power-new software available from the US Robotics bulletin board service
- QuickConnect™: Completes handshake and begins transmission within 7 seconds
- Dial and Link Security with Dialback: Verifies authorised callers and modems



**\$329**

FMROB005

# SPIRIT Products

**SPIRIT**

## MODEMS

V90 ITU Standard

## Spirit 560SP External 56,000bps FMSP1007 \$195

Internet Voice fax/modem with Speakerphone + SVD external 56k high speed fax/modem that supports the Rockwell K56Flex standard and popular data & fax standards up to 33,600bps. Hardware based error correction & data compression. Includes Windows fax and communications software with voice mail system, plus Windows Internet software.

### All Modems include:

- 9/25 serial cable and Power supply (ext model)
- Phone cord (all models)
- Installation instructions & documentation
- Software: Internet dialler & browser, data terminal emulation software, send receive fax application and voice mail system

## Spirit Ranger 56K

**\$99** FMSP1008

**SPECIAL PRICE with any Adelung System. Call for details.**

Code	Description	Price
FMSP1007	Spirit 560SP External 56k Fax/Modem SVD	\$195
FMSP1006	Int. 56K,SVD, Spk Ph.	\$169
FMSP1000	336EL Ext. 33.6K,SVD, Spk Ph.	\$125

**560ISP Internal 56K Model \$169**



## PCMCIA

**SPIRIT SCORPION 56**

new

## Spirit Scorpion 56 FMSP1009 \$280

The Spirit Scorpion 56 fax/modem PC Card offers the features of a desktop fax/modem in a small "credit-card" size. Both KFlex and V90. Ready, the Scorpion 56 is a breeze to install and comes supplied with a full complement of software.

This PC Card enables the mobile professional to exchange data faster using a range of notebooks/palmtops running Win 3.1x/95/98/NT/CE.

**PCMCIA Ethernet Adaptor NWSIP000 \$150**

## Multimedia



**\$145**

MMSP1000

## Spirit TV Video Card

Turn your PC into a TV. PCI card that brings full TV reception capabilities to your PC. Features full motion video and "still" capture.

## Networking

Spirit networking includes a full compliment of NICs and Hubs in 10, 100 and 10/100 configurations.



**5 Port Hub NWSPI003 \$99**

**PCI Network Cards NWSPI002 \$55**

**ISA Network Card NWSPI001 \$39**

**10/100 PCI NIC NWSPI001 \$125**

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

**1800 626 345 FREE CALL**

\*Please read our Terms and Conditions



## SparQ 1.0GB Drive

'The personal solution'.

A superb combination of high performance at an affordable price. Easily backup your laptop or desktop system in minutes. **SparQ** gives you the bandwidth you need for show-stopping multimedia presentations and archive your Internet downloads. Play your favourite games off a **SparQ** cartridge at twice the speed of a CD. Backup your computer in minutes. Transfer files, applications and operating systems from home to office for extreme flexibility and multitasking.

**\$495**



**Bonus Software Incl:**

- Seagsoft Heat Net
- Novastor Novadisk SE
- Serif Drawplus 3.0 SE
- Netresults WEBVCR
- Alta Vista Howdy
- SPRYNET
- McAfee Webscan

**Features:**

- 1.0 GB Capacity
- Buffer/Cache: 512 KBytes
- High Performance Hard Drive

Code	Model	Price
BUSYQ004	SPARQ 1.0GB EIDE INT	<b>\$495</b>
BUSYQ005	SPARQ 1.0GB PRT EXT	<b>\$495</b>
BUSYQ009	SPARQ 1.0GB MEDIA PC	<b>\$95</b>

## SyJet 1.5GB Drive

'The personal solution'.

Award-winning high performance removable cartridge hard drive. Enough capacity to hold over 1,000 floppies on a 3oz. cartridge. The logical choice for professional musicians, audio mixers, digital video editors, graphic designers, webmasters, desktop publishers and game players. Fast enough to store, edit and run full-motion video. Holds more than 80 minutes of broadcast quality video. Record, edit and run your audio compositions for seamless playback. Holds over 2 hours of CD-quality audio. Create animation, audio and video sequences for multimedia presentations. Run directly off a **SyJet** cartridge. Work directly from **SyJet** and minimise clutter on your internal drives.

**\$695**



**Features:**

- 1.5 GB Capacity
- Buffer/Cache: 512 KBytes
- High Performance Hard Drive
- Ground breaking technology
- Portable drive/light weight
- High speed, high volume

Code	Model	Price
BUSYQ000	SYJET 1.5GB IDE INT	<b>\$695</b>
BUSYQ001	SYJET 1.5GB SCSI EXT	<b>\$695</b>
BUSYQ002	SYJET 1.5GB SCSI INT	<b>\$695</b>
BUSYQ003	SYJET 1.5GB PRT EXT	<b>\$695</b>
BUSYQ008	SYJET 1.5GB MEDIA PC	<b>\$179</b>

## EZFlyer™ 230 Drive

The **EZFlyer™ 230** combines the flexibility of a data cartridge with the speed of hard drive technology. Easy-to-use, small and lightweight, the drive can be carried around in your pocket. The **EZFlyer™ 230** provides more space just by adding more cartridges. Carry large graphics files in the palm of your hand. Excellent storage device for desktop publishing, pre-press, Internet, photography, multimedia, imaging, video, audio and back-ups. The **EZFlyer™ 230** features external SCSI and Parallel Port.

**\$345**



**Features:**

- 230 MB Cap., Int.EIDE
- 13.5 msec average seek time
- External SCSI & Parallel Port
- Superior HD performance
- Small and lightweight
- Auto eject button

Code	Model	Price
BUSYQ006	EZFLYER 230MB SCSI EXT	<b>\$345</b>
BUSYQ007	EZFLYER 230MB PRT EXT	<b>\$345</b>
BUSYQ010	EZFLYER 230MB MEDIA PC	<b>\$75</b>

**State-of-the-art technology for MAC & PC file storage!**



# Monitors

# Panasonic



Adelony Computers

Panasonic's NEW Digital technology sets the standards for Top performing high-end monitors. All monitors feature true-type colours, excellent focus and convergence, power saving functions and crystal clarity in colour display.

## PanaSync P70

17" Digital Multiscan colour FST display.  
The monitor that's very sharp and compact in size.

### SPECIFICATIONS

- 17" flat screen monitor
- 0.25mm dot pitch
- Advanced anti-glare, anti-static coating
- On-Screen display controls
- 1600x1200 max.res.
- 16" viewable area

**\$965** MOPAN003



## PanaFlat LC40

14" colour monitor with state-of-the-art design creating a slim profile.

### SPECIFICATIONS

- 14" flat screen monitor
- 0.2775mm dot pitch
- Anti-glare, anti-static coating
- On-Screen display controls
- 1024x768 max.res.
- 14" viewable area

**\$2350** MOPAN002



## PanaSync/ProP110

21" monitor utilising Digital technology demonstrating enhanced imagery and colour sharpness.

### SPECIFICATIONS

- 21" flat screen monitor
- 0.25mm dot pitch
- Anti-glare, anti-static coating
- On-Screen display controls
- 1800x1440 max.res.
- 20" viewable area

**\$2695** MOPAN000



## PanaSync SL70

17" Digital Multiscan colour FST display.  
The monitor that's very sharp and compact in size.

### SPECIFICATIONS

- 17" flat screen monitor
- 0.27mm dot pitch
- Advanced anti-glare, anti-static coating
- On-Screen display controls
- 1280x1024 max.res.
- 16" viewable area

**\$795** MOPAN003



## PanaSync S70

Energy-Saving 17" Display with Automatic frequency selection from 30K - 70kHz.

### SPECIFICATIONS

- 17" flat screen monitor
- 0.27mm dot pitch
- Anti-glare, anti-static coating
- On-Screen display controls
- 1280x1024 max.res.
- 16" viewable area

**\$765** MOPAN004

## PanaSync™ 4

A valuable multi-scan 15" display with higher picture quality for ecologically aware professionals.

### SPECIFICATIONS

- 15" flat screen monitor
- 0.27mm dot pitch
- Anti-glare, anti-static coating
- 1280x1024 max.res.
- 13.7" viewable area

**\$399** MOPAN005



## PanaSync S110

The 21" monitor that takes brightness to a new level and places its focus on high image quality.

### SPECIFICATIONS

- 21" flat screen monitor
- 0.25mm dot pitch
- Anti-glare, anti-static coating
- On-Screen display controls
- 1600x1200 max.res.
- 20" viewable area

**\$2165** MOPAN001



# Drives

# Panasonic

## LS 120 120MB LKM-F434-1

- Lge storage cap. of 120MB in a single LS-120 diskette
- 100% compat. with existing 3.5" diskette media
- Supported by MS DOS, Windows (3X, 95, NT)
- 5 x faster than stand.
- 1.44MB drives-using LOS-120 disk.
- Boot., can act as a Boot Drive when approp. BIOS inst.



BUPAN000 **\$175**

**New Drives using state-of-the-art technology for high capacity data storage**

## CD ROM 32X CR-588-B

Panasonic CD-Rom Drive with an excellent reputation for reliability for performance. Superfast 32x speed reading, this can also read CDRW disc.



MMPAN002 **\$130**

## ZIP Drive JU-811T01

- 100Mb Capacity (70 FDDs)
- Able to transmit image files, desktop publishing, music files and video clips
- Data transfer rate: Sustained up to 11.2 Mbits/Sec, Burst Up to 26.7 Mbits/sec
- Comes with free software Toolbox for Zip



BUPAN001 **\$169**

## CD Recordable (4Wx8R) CW-7502-BAB

CD-Recordable Drive Kit, 4-speed write/8-speed read bundles with software & SCSI interface



MMPAN003 **\$735** (KIT)  
MMPAN004 **\$575** (BARE DRIVE)

## CD ROM SCSI 24X CR-508-BPA

Panasonic CD508B SCSI 2 CD-Rom drive is one of the best performing drives available. Super fast access time of 85ms and 3600KB/s sustained transfer rate.



MMPAN001 **\$175**

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

\*Please read our Terms and Conditions

**1800 626 345** FREE CALL



# Monitors, Input & Storage



**Mitsubishi  
Diamond View  
1554 15"**  
**\$355**  
MOMIT003

Advanced Plug & Play

Superior image  
fidelity 0.28DP

Maximum Resolution  
1024x768 up to 66Hz

13.6" True viewable



**Mitsubishi  
Diamond View  
1772E 17"**  
**\$695**  
MOMIT002

Advanced PnP compatibility

Superior image  
fidelity 0.27DP

Freq H: 30-72KHz  
Freq V: 50-120Hz

Maximum Resolution:  
1280x1024 up to 60Hz

16.0" True Viewable



**Mitsubishi  
Diamond Plus  
71 17"**  
**\$905**  
MOMIT001

DIAMONDTRON Monitor,  
with the super-fine aperture  
grille pitch of 0.25mm

Maximum Resolution  
1280x1024 up to 65Hz

16.0" True viewable



**Mitsubishi  
Diamond Pro  
91TXM 21"**  
**\$2995**  
MOMIT000

A new DIAMONDTRON  
Monitor, with the super-fine  
aperture grille pitch of 0.28mm

Maximum Resolution  
1280x1024

19.7" True viewable

**new**

**Mitsubishi  
15" LCD TFT**  
**\$3750**  
MOMIT004

15" LCD TFT Monitor with  
the grille pitch of 0.28mm

Maximum Resolution  
1024x768



## Keyboards

**Mitsubishi Diamond Touch  
Ergonomic Keyboard**  
**\$49** IOMIT001

**Mitsubishi Diamond Touch  
Economical Keyboard**  
**\$30** IOMIT000



## Storage

The new standard  
in diskette storage.

**Code Model Price**  
BUMIT000 Mitsubishi LS - 120 - 120MB Capacity. **\$180**

Mitsubishi LS-120 FACTS:

- Large storage capacity of 120MB in a single LS-120 diskette.
- 100% compatibility with existing 3.5" diskette media
- Supported by MS DOS, Windows (3X, 95, NT)
- Bootable, can act as a Boot Drive when appropriate BIOS installed

BUMIT001 120MB capacity diskettes to suit LS - 120 Drive **\$25**

**Code Model Price**  
FDMIT000 Mitsubishi Diamond Data 1.44MB Floppy disk drive. **\$36**  
MMMIT002 6x2 CD Rewriter 6206D IDE KIT + SW + CD **\$650**  
FMMIT000 Diamond Voice V.90 56K Internal Modem **\$140**  
FMMIT001 Diamond Voice V.90 56K External Modem **\$150**

**Code Model Price**  
MMMIT000 Diamond Data 24x CD-ROM **\$105**  
• E-IDE/ATAPI interface.  
• 3600KB/sec maximum data transfer rate (24x max)  
• 125ms typical access time

MMMIT001 Diamond Data 32X CD-ROM **\$118**





# Monitors

**Hansol**



Adelony Computers

**Hansol brings you Monitors with windows to the world of absolute brilliant colour. Hansol Monitors come with a THREE YEAR on-site warranty!**



**Hansol 701A**

Full featured professionals 17" (15.7 viewable), full square high resolution flat face colour monitor with 0.28 dot pitch.

**Specifications:**

- Easy to use
- Fully supports Windows 95
- Resolution of 1280 x 1024 at 60Hz(N/I)
- Bandwidth (-3dB) 110MHz
- Microprocessor
- Plug & Play
- Display area of 320 x 240mm
- User control with Power Switch, Reset, Manual Degaussing, Contrast & Brightness
- Power saving (DPMS)
- Standard EMI, Safety, Ergonomics & low rad.

**\$655** MOHAN004



**AWARD WINNING MONITOR**



**Hansol 700P**

Full featured professionals 17" (15.7 viewable), full square high resolution flat face colour monitor with 0.26 dot pitch.

**Specifications:**

- Easy to use
- Fully supports Windows 95
- Resolution of 1600 x 1200 at 66.6Hz(N/I)
- Bandwidth (-3dB) 135MHz
- Microprocessor
- Plug & Play
- Display area of 320 x 240mm
- User control with Power Switch, Reset, Manual Degaussing, Contrast & Brightness, H/V size, Tilt, Colour control
- Power saving (DPMS)
- Standard EMI, Safety, Ergonomics & low rad.

**\$755** MOHAN005



**Hansol 401A**

14" Diagonal colour monitor also available - 280 x 210mm with 0.28 dot pitch.

**Specifications:**

- Resolution of 1024x768 at 60Hz(N/I)
- Bandwidth (-3dB) 65MHz
- Microprocessor
- Plug & Play
- Display area of 274x206mm
- Standard EMI, Safety, Ergonomics and low radiation.

**\$269** MOHAN000



**Hansol 500A**

15" Diagonal colour monitor 280 x 210mm with 0.28 dot pitch.

**Specifications:**

- Easy to use
- Fully supports Windows 95
- Display area of 280 x 210mm
- Ergonomics and low radiation
- Resolution of 1024 x 768-60Hz
- Standard EMI, Safety, Bandwidth 65MHz, Universal Power, Microprocessor, Plug & Play

**\$335** MOHAN001



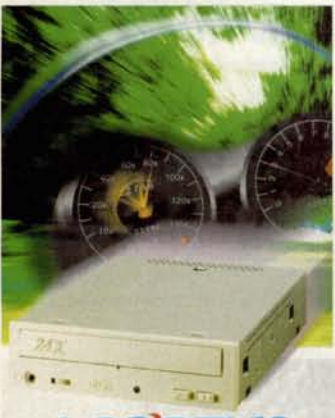
**Hansol 500M**

15" Diagonal colour monitor 280 x 210mm with 0.28 dot pitch.

**Specifications:**

- Easy to use
- Fully supports Windows 95
- Display area of 280 x 210mm
- Ergonomics and low radiation
- Resolution of 1024 x 768-60Hz
- Standard EMI, Safety, Bandwidth 65MHz, Universal Power, Microprocessor, Plug & Play

**\$380** MOHAN003



**LEOPTICS**

**24X CD-ROM Drive**

- Intelligent latest advanced technology
- Has a good suspension for vibration control
- Front panel with a direct Audio CD play function button
- High data transfer rate-----3600 KB/Sec.
- Data access speed is powerful-----100 msec.
- Multi-Read function (include CD-R & CD-RW)

**\$90** MMLEO000

**32X CD-ROM Drive**

- Intelligent latest advanced technology
- Has a good suspension for vibration control
- Front panel with a direct Audio CD play function button
- High data transfer rate-----4800 KB/Sec.
- Data access speed is powerful-----100 msec.

**\$110** MMLEO001

**CD-Recordable/Re-Writable Multi-function Disc Drive**

- Unique multi-function concept combining 6x CD-ROM reader, 2x CD-Rewritable drive
- Automatic media selection for CD, CD-R or CD-RW
- ANSI standardised MMC (MultiMedia Command) set
- Plug & Play CD-ROM drive for all modern PC operating systems
- IDE/ATAPI interface - no need for costly SCSI adaptors
- Supports TAO (Track At Once), DAO (Disc At Once), MS (Multi-Session), fixed and variable (Incremental Packet) writing modes, as well as CD-DA, CD-ROM (XA), CD-Bridge, Multi-Session, CD-I, Video-CD and CD-UDF disc formats

**\$Call** MMLEO002

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

\*Please read our Terms and Conditions

**1800 626 345 FREE CALL**



## SONY

## Monitors

**GDM-500PS \$3825** MOSON007

- 21" Trinitron CRT (19.8" viewable image size)
- Sony Elliptical Correction System technology
- New Flatter CRT Design
- Super Fine 0.25-0.27mm Variable Aperture Grille
- Supports PC and Mac resolutions up to 1600 x 1200 @ 85Hz



Active Signal Correction (ASC),  
automatic screen sizing and centering  
Dual inputs N15 pin D-sub and 5 BNC

**GDM-400PS \$2275** MOSON006

- 19" Trinitron CRT (18.0" viewable image size)
- Sony Elliptical Correction System technology
- New Flatter CRT Design
- Super Fine 0.25-0.27mm Variable Aperture Grille
- Supports PC and Mac resolutions up to 1600 x 1200 @ 75Hz



Active Signal Correction (ASC),  
automatic screen sizing and centering  
Dual inputs N15 pin D-sub and 5 BNC

**GDM-200PS \$1990** MOSON004

- 17" Trinitron CRT (16.0" viewable image size)
- Sony Elliptical Correction System technology
- New Flatter CRT Design
- Super Fine 0.25mm Aperture Grille Pitch
- Supports PC and Mac resolutions up to 1600 x 1200 @ 70Hz



Active Signal Correction (ASC),  
automatic screen sizing and centering  
Dual inputs N15 pin D-sub and 5 BNC

**GDM-200ES \$1175** MOSON003

- 17" Trinitron CRT (16.0" viewable image size)
- Sony Elliptical Correction System technology
- New Flatter CRT Design
- Super Fine 0.25mm Aperture Grille Pitch
- Supports PC and Mac resolutions up to 1280 x 1024 @ 60Hz



On-screen digital controls  
Built-in self-diagnosis function  
International Energy Star compliant



## DAEWOO

## Monitors

Featuring the latest technology, Daewoo introduces a new range of sophisticated colour monitors that brings life to the screen. Daewoo is the 'One to Watch'.

**MODEL CMC-431X**  
14" XGA Colour Monitor**SPECIFICATIONS**

- 14"/0.28mm dot pitch
- Non-glare face
- 65 MHz bandwidth
- Digital controls
- 80 Watt consumption
- DDC compatibility
- Energy saving
- 250 x 187mm display
- Low radiation
- Safe & Ergonomical
- Flicker-free display
- Display power management

**\$260**  
MODAE000

**MODEL 518B**  
15" Colour Monitor**SPECIFICATIONS**

- 15"/0.28mm dot pitch
- Non-glare face, Anti-static
- 85 MHz bandwidth
- On-screen digital controls
- 75 Watt consumption
- DDC compatibility
- Energy saving
- 265 x 198mm display
- Low radiation
- Safe & Ergonomical
- Flicker-free display
- Display power management

**\$350**  
MODAE001

**MODEL CMC-1705B**  
17" Multimedia Colour Monitor**SPECIFICATIONS**

- 17"/0.28mm dot pitch
- Non-glare face, Anti-static
- 85 MHz bandwidth
- On-screen digital controls
- 90 Watt consumption
- DDC compatibility
- Energy saving
- 310 x 233mm display area
- Low radiation
- Safe & Ergonomical
- Flicker-free display
- Display power management

**\$799**  
MODAE003

**MODEL CMC-1509B**  
15" Multimedia Colour Monitor**SPECIFICATIONS**

- 15"/0.28mm dot pitch
- Non-glare face, Anti-static
- 85 MHz bandwidth
- On-screen digital controls
- 90 Watt consumption
- DDC compatibility
- Energy saving
- 270 x 203mm display area
- Low radiation
- Safe & Ergonomical
- Flicker-free display
- Display power management

**\$420**  
MODAE002

**MODEL CMC-1707B**  
17" Multi Scan Colour Monitor**SPECIFICATIONS**

- 17"/0.28mm dot pitch
- Non-glare face, Anti-static
- 85 MHz bandwidth
- On-screen digital controls
- 120 Watt consumption
- DDC compatibility
- Energy saving
- 300 x 225mm display area
- Low radiation
- Safe & Ergonomical
- Flicker-free display
- Display power management

**\$695**  
MODAE004



# Networking

# D-Link



Adelony Computers



**\$85**  
NWDLI002

## DFE-500TX PCI-bus 10/100M fast Ethernet network interface card

Intelligent Ethernet/Fast Ethernet adaptor, Auto negotiating 10Base-T/100Base-TX (Nway), Plug and Play support, low CPU utilisation, 32 bit high performance bus master, Optional remote boot rom, Certified driver for Netware, SCO Unix, Windows 95 and Windows NT.



**\$112**  
NWDLI003

## DE-660CT PC Card Ethernet network interface card with RJ-45/BNC connectors, JITI function supported

PCMCIA card with RJ-45 & BNC connectors, Full plug and play, Autodetection of cable type, Supports full duplex, Netware, SCO Unix, Windows 95 and Windows NT compatible, Support D-link just-in-time-interrupt (JITI) technology, 30% faster than other standard PCMCIA card.



**\$205**  
NWDLI006

## DE-905/N Ethernet Network Kit (5-port Ethernet Hub & 2 ISA-bus Ethernet card)

Network kit for SOHO user, Easy to install, includes two Cat-5, 20 feet cables and AC power adaptor for hub, simple plug-and-play installation, D-link hubby received CeBit 95 Highlight Award.



**\$1695**  
NWDLI014

## DES-1008/N 8-port Ethernet/Fast Ethernet Switch with 8x N-Way UTP ports

8 port UTP Auto negotiating 10/100Mbit switch (N-Way), Supports UTP/STP cables, MDI-II port, Support full/half duplex, Provides cut-through and fast store & forward switching, Auto polarity correction, Dynamic buffer allocation for network load balancing, Desktop size.

Code	Model	Description	Price
NWDLI000	DE-220PCT	ISA Bus PnP Ethernet Adaptor with RJ-45/BNC Connectors	\$35
NWDLI001	DE-528CT	PCI-bus Ethernet adaptor with RJ-45/BNC connectors	\$50
NWDLI004	DE-809TC/N	8-port 10Base-T Ethernet Unmanaged Hub with BNC support	\$159
NWDLI005	DE-816TP/N	16-port 10Base-T Ethernet Unmanaged Hub with 1 AUI & 1 BNC ports (Rack-mount)	\$350
NWDLI011	DES-810	8-port Switch hub, 8x10 BASE-T, 2x100 NWay ports, UTP/STP supported	\$899
NWDLI013	DFE-650TX	Fast Ethernet 10/100MB dual speed NWay PCMCIA card	\$245
NWDLI012	DFE-908X	8 Port 10/100MB dual speed Hub with switching	\$896
NWDLI014	DFE-916X	16 Port 10/100MB dual speed Hub with switching	\$1339
NWDLI015	DP-300	10/100MB dual speed Fast Ethernet Multiprotocol print server	\$559
NWDLI016	DFE-530TX	PCI Bus 10/100 Fast Ethernet Network Interface card	\$59

# Control Cards & Networking



## 5 Port 10Mbps Ethernet Hub

NWGEN002 **\$79**  
 • Great for the home or small office  
 • Uplink port means expandability



## 8 Port 10Mbps Ethernet Hub

NWGEN003 **\$99**  
 • Uplink Port  
 • Cascading with additional hubs  
 • BNC and UTP support



## 16 Port 10Mbps Ethernet Hub

NWGEN004 **\$225**  
 • Rack mountable  
 • Uplink Port  
 • Utilisation LED  
 • BNC and UTP support

## ADAPTEC DESKTOP SCSI

Code	Model	Tfr Rate Mb/s	Price
CCGEN001	AHA-1520	10	\$155
CCGEN003	AHA-2940U	20	\$375
CCGEN004	AHA-2940UK	20	\$495
CCGEN005	AHA-2940UW	40	\$395
CCGEN006	AHA-2940UWK	40	\$620

## ADAPTEC SLIM SCSI FOR NOTEBOOK

Code	Model	Tfr Rate Mb/s	Price
CCGEN011	AHA1460	20	\$375

## I/O CONTROL CARDS

Code	Model	Price
CCGEN000	ISA MULTI I/O	\$35
CCGEN015	ISA PRINT CARD	\$20

**PLEASE CALL FOR ALL NETWORKING CABLES**



**Intel** EtherExpress PRO Ethernet Cards. These adapters take full advantage of available bandwidth with its 32-bit -bus-master architecture.

Code	Model	Price
NWGEN010	EtherExpress Pro PCI 10/100TX (RJ-45)	\$185
NWGEN009	EtherExpress Pro PCI 10PT	\$180

## 3Com

Code	Model	Price
NW3CO000	Etherlink III ISA TP (RJ-45)	\$175
NW3CO005	Fast Etherlink XL 10/100 TX PCI	\$225
NW3CO007	Etherlink III PCMCIA Ethernet (RJ-45)	\$275
NW3CO016	Etherlink III PCMCIA 10/100 Ethernet	\$345

## Generic

Code	Model	Price
NWGEN000	ISA Ethernet Card (COMBO)	\$29
NWGEN001	PCI Ethernet Card (COMBO)	\$35
NWGEN002	5 PORT HUB with up-link port	\$79
NWGEN003	8 PORT HUB with up-link port	\$99
NWGEN004	16 PORT HUB with up-link port	\$225
NWGEN005	PCMCIA Ethernet Combo	\$139

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
 Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

\*Please read our Terms and Conditions

**1800 626 345 FREE CALL**



**TRAXDATA****CD Writers & Re-Writers****Traxdata is the biggest CD data-storage brand on the Planet!!****MUSIC****DATA****PHOTO****VIDEO**

**Traxdata** products make it easy to record your own CD's with the very latest technology available. Providing a total solution to all **CD Recording** needs from a wide range of **hardware, software** and **blank media**, Traxdata has the winning edge!

- Easy to use
- Easy to install
- Affordable
- Make your own  
high quality CD's

**Purchase any Traxdata product and you will go into the draw to win the sports car of your dreams or 14 consolation prizes of the latest DVD Players!**

**CD-Recordable Driver  
CDE4120 EL PRO**

- 4x/12x Recorder  
 • WinonCD 3.5 CD Mastering Software (OEM version)  
 • Packet CD UDF Recording Software for Win95®  
 • SCSI Cable  
 • 2x Traxdata CD-R Discs & Marker Pen  
 • Manuals
- MMTRA002 **\$795\*** (Int.)  
 MMTRA003 **\$895\*** (Ext.)

**WinonCD Professional V3.5  
UP TO 1.2GB DATA STORAGE  
CAPACITY ON A CD-ROM**

WinonCD Professional V3.5 Software.  
 Almost double your data capacity!  
 Compressed files can easily be opened on CD-ROM drives!

SWTRA007 **\$185**

**Re-Writable Driver  
CDRW4260 EL PRO**

- 4x Record/2x Erase/6x Playback  
**SCSI** Recorders packed complete with:  
 • WinonCD 3.5 CD Mastering Software (OEM version)  
 • Packet CD UDF Recording Software for Win95®  
 • SCSI Cable  
 • CD Marker Pen  
 • Manuals
- MMTRA005 **\$895\*** (Int.)  
 MMTRA017 **\$1045\*** (Ext.)

**Re-Writable Driver  
CDRW2260 EL PRO**

- 2x Record/2x Erase/6x Playback  
**SCSI** Recorders packed complete with:  
 • WinonCD 3.5 CD Mastering Software (OEM version)  
 • Packet CD UDF Recording Software for Win95®  
 • SCSI Cable  
 • CD Marker Pen  
 • Manuals
- MMTRA016 **\$699\*** (Int.)

**Re-Writable Driver  
CDRW2260 EL PLUS**

- 2x Record/2x Erase/6x Playback  
**IDE** Recorders packed complete with:  
 • WinonCD 3.5 CD Mastering Software (OEM version)  
 • Packet CD UDF Recording Software for Win95®  
 • Cable  
 • CD Marker Pen  
 • Manuals
- MMTRA004 **\$625** (Int.)  
 MMTRA018 **\$795** (Ext. Parallel)

**new**  
 Parallel  
 External  
 Model

**OTHER ITEMS**

Code	Model	Price
MMTRA006	PCI SCSI card kit	<b>\$139</b>
MMTRA009	Just Audio	<b>\$85</b>
MMTRA010	CD labelling kit	<b>\$85</b>
MMTRA011	50 Labels multi.col.	<b>\$35</b>
MMTRA007	BLANK CD-R	<b>\$3.50</b>
MMTRA008	BLANK CD-RW	<b>\$29</b>

\*add \$100 to include Ultra SCSI Adaptor  
**1.2GB Data Storage Capacity for all recorder kits**

**INTERNET WEB SITE:**  
<http://www.adelong.com.au>  
 e.mail: [info@adelong.com.au](mailto:info@adelong.com.au)

HEAD OFFICE & SERVICE  
 45-47 Ralph Street  
 Alexandria NSW 2015  
 Ph: (02) 9669 3188  
 Fax: (02) 9669 3216  
 Call for new showroom

CITY OFFICE  
 127 York Street  
 Sydney NSW 2000  
 Ph: (02) 9267 5272  
 Fax: (02) 9267 5042



# CD Writers & Re-Writers

**RICOH**



Adelony Computers

## A single drive that does it all. Reads, writes, Rewrites CD data.

The Ricoh MP6200 series drives have multi-function capabilities so they can efficiently handle any CD-based media from the world's first re-writable CD, Ricoh's CD-RW, to the write-once CD-R and CD-Rom.

With just one drive, you can always choose the perfect media to suit your applications.

Now supporting random access writing.



**Fast writing and reading 6x read  
2x write, CD-RW and CD-R  
writing, unlimited  
media selection**

**Ricoh CD-RW Disc  
74 Mins 650Mb**

MMRIC003 **\$35**

**MP6200AR  
(EIDE) ATAPI** MMRIC001 **\$650**

Internal EIDE CD-R/CD-RW Drive  
Direct CD Ver. 2.0, Easy CD  
Creator 95/NT, 1 CD-R Disc,  
1 CD-RW Disc Operation Manual,  
Audio Cable, Mounting Screws

**MP6200SR (SCSI)** MMRIC000 **\$695**

Internal SCSI CD-R/CD-RW Drive  
Direct CD Ver. 2.0, Easy CD Creator 95/NT  
4 CD-R Disc, 1 CD-RW Disc  
Operation Manual, Audio Cable,  
Mounting Screws

**Ricoh CD-R Disc  
74 Mins 650Mb**

MMRIC004 **\$4**

# Protect your Investment

## MGE UPS Pulsar Series For small businesses

MGE UPS SYSTEMS is the first UPS manufacturer to design a range of UPS that meet the specific requirements and restrictions of small businesses.

### Pulsar ES+ UPS

- Total protection for your equipment
- Power protection with backup
- Solution pack software included
- Fax/Modem line filtering

Code	Model	Price
PSMGE000	ES2+5min backup-time for a PC	<b>\$325</b>
PSMGE001	ES5+20min backup-time for a PC	<b>\$410</b>



### Pulsar EL UPS

- Entry level solution
- Total protection for your equipment

Code	Model	Price
PSMGE002	EL2+5min backup-time for a PC	<b>\$240</b>
PSMGE003	EL4+20min backup-time for a PC	<b>\$320</b>



## Power Filter

### Computer and equipment protection!

- Powercor premium grade AC power filter technology to reduce surge/spike and transient damage.
- Power grid comes with 4 individually wired plugs.

Code	Model	Price
PSGEN004	<b>ZAPTRAP</b> - Multistage filter	<b>\$140</b>
PSGEN005	<b>ZAPCATCHER</b> - Multistage filter with Telecom line surge protection	<b>\$150</b>



Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

\*Please read our Terms and Conditions

**1800 626 345** **FREE CALL**





## Imation<sup>®</sup> SuperDisk<sup>®</sup> Drives

- **Double Duty** - The SuperDisk drive reads and writes both 120MB SuperDisk diskettes and regular floppies.
- **Fast** - Up to five times faster than a regular floppy drive.
- **Easy to Use** - The hassle-free way to handle large and small files through a single drive.
- **Less Hassle** - With SuperDisk technology, there's no more disk swapping, no more "out of disk space" errors.

Save a little - on your old floppies  
Save a lot - on 120MB SuperDisk diskettes  
Save the world - SuperDisk drives work with both!



BUIMA000 **\$270**

Code	Model	Price
BUIMA001	Super Disk LS-120 Diskettes (1 pack)	<b>\$22</b>
	Super Disk LS-120 Diskettes (3 pack)	<b>\$65</b>
	Super Disk LS-120 Diskettes (5 pack)	<b>\$105</b>
	Super Disk LS-120 Diskettes (10 pack)	<b>\$200</b>

## Specials



Carry Bag  
was **\$149**  
now **\$95**

- Notebook and Printer Compartments
- MSGEN004



Super Micro P6 SNE II  
+ Pentium II 266MMX  
**\$499**

- AT Form Factor
- MBSUP003



DTK Pentium II  
Mainboard  
FX Chipset  
was **\$199**  
now **\$90**

- Pentium II 233-300MHz
  - ATX Form Factor
  - Simm slot
- MBDTK004



Intel VX Chipset with  
built-in I/O and  
Sound Blaster 16  
**\$50**

- ATX Form Factor
  - Compatible with Cyrix, AMD, Intel Pentium & MMX Series CPU
- MBGIG007

Code	Model	Price
MBDTK000	Pentium Pro Mainboard	<b>\$90</b>
IOHPD010	HP auto document feed (for 3C/4C/4P Scanner)	<b>\$95</b>
SWQIK004	Quick Payroll Pro V3	<b>\$200</b>
SWMFE002	Mcafee Web Scan	<b>\$25</b>



# Speakers

# JAZZ



Adelony Computers



## J-703 MMJAZ027 \$155

- 28 Watts RMS total power
- Wood cabinet
- 2 way speakers
- 4" woofer
- 2" tweeter
- 75-20,000Hz freq. response
- Volume, treble, bass controls
- Headphone jack
- Power on/off button
- Magnetically shielded
- 140mmx300mmx183mm (WxHxD)



## J-707 MMJAZ028 \$175

- 28 Watts RMS total power
- Wood cabinet
- 2 way speakers
- 5" woofer
- 2" tweeter
- 75-20,000Hz freq. response
- Volume, treble, bass controls
- Headphone jack
- Power on/off button
- Magnetically shielded
- 170mmx348mmx183mm (WxHxD)

## J-215 40W \$25 MMJAZ018



## JS-100 128W \$75 MMJAZ001



## JS-200 200W \$85 MMJAZ002



## JS-300 450W \$99 MMJAZ003

**Adjustable 3D Sound**  
The JS-200 & 300 offer customised 3D sound control not found on any other multimedia speaker.



## J-904 200W \$75 MMJAZ025



## JS-900 300W \$110 MMJAZ004



## J-818 500W \$185 MMJAZ019



Specifications	J-215	JS-100	JS-200	JS-300	JS-900	J-904	J-818
Total RMS Power	2W	8W	12W	28W	18W	10W	28W
Driver Configuration	3"	3"	3"	3" 3" 1"	4"	4"	4" 2"
Frequency Response	150Hz to 20KHz	75Hz to 20KHz	75Hz to 20KHz	50Hz to 20KHz	50Hz to 250Hz	50Hz to 250Hz	75Hz to 20KHz
3D Sound		•		•			
Adjustable 3D Sound				MUSIC THEATER GAME	MUSIC THEATER GAME		
<b>CONTROLS</b>							
Volume	•	•	•	•	•	•	•
Treble		•	•	•			•
Bass		•	•	•			•
Balance		•	•	•			
Tone							
Bass Boost							
Subwoofer Output Jack		•	•	•			
Headphone Jack	•	•	•	•			
Microphone Pass-through Jack		•	•	•			
Mute		•	•	•			
Dual Inputs		•	•	•			
Magnetically Shielded	•	•	•	•	•	•	•
Dimensions/mm (w/h/d)	78 x 179 x 119mm	127 x 280 x 127mm	127 x 280 x 127mm	127 x 280 x 127mm	150 x 224 x 330mm	160 x 123 x 240mm	140 x 300 x 183mm



## J-908ST

### Subwoofer & Speaker

- Peak Music Power Output: **400W**
- Drivers: One 4" Subwoofer Cone  
One 3" Full Range Cone  
One 1" High Range Cone
- Freq Resp: Subwoofer 35Hz-250Hz  
Satellites 100Hz-15KHz
- 3D Controls: On/Off
- Controls: Power/Volume
- Input: 3.5mm Stereo Plug
- Output: RCA Jack
- Indicator: Power LED

MMJAZ015 **\$130**

## J-HS14 M/phone

Multimedia combination headset and boom microphone

MMJAZ009 **\$20**



## J-S124 M/phone

Desktop Microphone including baseInput: 3.5mm Mini Stereo jack

MMJAZ008 **\$15**



Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

\*Please read our Terms and Conditions

**1800 626 345** **FREE CALL**



# Canon

# Printers / Scanners



- BJC-50** PRCAN020 **\$675**
- Half the size of the BJC-80 but not half the performance.
  - Featuring a InfraRed Port and LithiumIon Battery which is good for 100 A4 prints.
  - Maximum resolution of 720dpi at up to 5.5ppm
  - Snap in the optional scanner head for 360dpi full colour scanning.



- BJC-80** PRCAN000 **\$399**
- Drop Modulation Technology - the dual drop size breakthrough that **produces smoother colour gradations.**
  - Office laser quality finish & B&W speeds up to 5 pages per min. with dedicated black cartridge.
  - Windows® 95 compatible IrDA infrared port for cable-less communications.
  - Fits in half a briefcase & only 1.4Kg!
  - **Optional scanner head for colour graphics, OCR & faxing.**
- PRCAN001 **\$149**



- BJC-4200** PRCAN003 **\$255**
- **Offers speed and versatility at an unbeatable price.**
  - Outstanding plain paper output, Photo Mode colour up to 720 dpi.
  - Four ink options for any printing task; Standard colour, high speed black, PhotoRealism and Fluorescent ink.
  - PhotoRealism printing for photographic reproduction with richer, more life-like colours.
  - Fluorescent ink option



- BJC-4300** PRCAN014 **\$315**
- **EVERYTHING THE BJC-4200 DOES & MORE!!**
  - Exclusive Drop Modulation Technology.
  - Photo-Realistic Colour.
  - Canon Creative Software, Banner Printing.
  - Prints at up to 5ppm
  - Exclusive Colour Image Scanner
- Cartridge (optional), scans at 360dpi.



- BJC-7000** PRCAN012 **\$615**
- 7-colour ink system and 9 saturation levels per pixel for **incredibly rich photographic half-tones.**
  - Combined total of 1088 print nozzles firing up to 10,000 drops per second!
  - P-POP (Plain Paper Optimised Printing) gives plain paper a coated paper quality finish.
  - Documents printed with P-POP are 99.4% water fast!



- BJC-255SP** PRCAN017 **\$168**
- Super Economy mode for colour and B&W.
  - Photo Mode printing for colour that rivals more expensive four-colour systems.
  - Prints up to 2400 B&W pages and 600 colour pages.
  - New high capacity black cartridge 20% more ink, no extra cost.
  - Up to 5 times the output of direct competitors.



- LBP-1760** PRCAN018 **\$1999**  
**Laser Printer**
- **High speed - 17ppm**
  - 1200 dpi print resolution
  - Outstanding graphics
  - Full range of options
  - Networkable



- BJC-4550** PRCAN005 **\$599**
- A3 colour printing, **perfect for CAD, DTP and spreadsheet work.**
  - Supports black & various colour cartridge options.
  - PhotoRealism option for photographic reproduction with richer, more life-like colours.



- PS-350** MMCAN000 **\$595**  
**Digital Camera**
- PC Magazines Editors Choice
  - Best price & performance
  - Built-in colour LCD
  - Flash ram for unlimited storage
  - All software supplied including Photo Impact
  - Windows & Mac compatible, NTSC TV video display
  - Package includes rechargeable NiCd batteries & software
  - High quality 640 x 480 resolution images
  - Built-in flash & auto red eye reduction



- Canoscan FB310** IOCAN000 **\$195**
- Canon's most space-saving solution to flatbed scanning!**
- Excellent 30-bit input/24-bit output.
  - Operates without noise.
  - Produces outstanding full-colour scans at 300dpi.
  - Connects via Parallel Port

- Canoscan FB610** IOCAN001 **\$365**
- Connects via Parallel Port
  - Optical scans at 600 x 1200dpi.



# Printers



HEWLETT  
PACKARD

EPSON



Adelung Computers

## HP 890C

- Up to **9ppm black**
- New Photo RET II
- Professional Photo Quality output
- Optional HP JetDirect for Network Connection

**\$775**

PRHPD025



## HP 1120C

**600dpi C-Ret & Colour Smart II**

- Print on various mediums from Post Card to A3 Paper
- 3 paper paths
- 6.5ppm black and 3.5ppm colour
- Optional HP JetDirect for Network Connection

**\$950**

PRHPD032



**\$399**

PREPS002

## STYLUS COL. 600,

1440X720 DPI, 3PPM, WIN COMP. With its remarkable 1440 x 720 dpi capability, the Epson Stylus COLOR 600 sets a new standard for cost-efficient, photo-quality colour printing without the need for expensive options.



**\$545**

PREPS003

## STYLUS COL. 800,

1440X720 DPI, 7PPM The new Epson Stylus COLOR 800 is targeted at business/corporate and professional graphics users. It includes speeds which eclipse many desktop laser printers as well as an amazing photo-quality resolution of 1440 by 720 dpi.



## HP 720C

- PhotoREt II delivers **smaller ink drops & more colour shades**
- The HP DeskJet 720C is designed for Microsoft® Windows® 3.1x, Windows 95 and Windows® NT 4.0 OS & supports Intel's MMX technology for faster colour processing
- Prints fast - up to 8 pages per minute.

**\$575**

PRHPD031



## HP 6L

- **Compact size**
- 600dpi RET
- Up to (6ppm) makes the HP 6L the ideal printer for the home or small office

**\$649**

PRHPD009



**\$845**

PREPS015

## STYLUS PHOTO EX.

The Epson Stylus Photo EX is the perfect printer for photo reproduction, pre-proof graphics. Industry-leading 1440dpi resolution with a six-colour ink system and A3 paper handling.



Code	Model	Price
PRHPD010	LaserJet 6P	<b>\$1339</b>
PRHPD021	DeskJet 692C	<b>\$380</b>
PRHPD000	DeskJet 340	<b>\$469</b>
PRHPD002	DeskJet 670C	<b>\$245</b>
PRHPD036	DeskJet 2000C	<b>\$Call</b>
PRHPD034	LaserJet 3100	<b>\$1395</b>
PRHPD035	OfficeJet Pro 1170C	<b>\$1395</b>

Code	Model	Price
PREPS001	Stylus Col. 400	<b>\$299</b>
PREPS010	Stylus Col. 1520	<b>\$1695</b>
PREPS016	Stylus Col. 850	<b>\$745</b>
PREPS011	Stylus Photo 700	<b>\$509</b>

# Ink & Toner Cartridges

## Canon

Code	Description	Printer compatibility	Price
INCAN000	BC01 BLACK	BJ10/20	<b>\$45</b>
INCAN001	BC02 BLACK	BJ200/BJ210/BJ240	<b>\$45</b>
INCAN002	BC05 COLOUR	BJ210/240	<b>\$49</b>
INCAN003	BC06 PHOTO COLOUR	BJ240	<b>\$49</b>
INCAN004	BC06 PHOTO COLOUR KIT	BJ240	<b>\$65</b>
INCAN005	BC09F FLURO COLOUR	BJ210/BJ240	<b>\$79</b>
INCAN006	BC10 BLACK & HEAD	BJ30/BJ70	<b>\$55</b>
INCAN007	BC1-10 BLACK	BJ30/70	<b>\$25</b>
INCAN008	BC11 COLOUR & HEAD	BJ70	<b>\$65</b>
INCAN009	BC1-11 BLACK (3 PK)	BJ70	<b>\$25</b>
INCAN010	BC1-11C COLOUR (3 PK)	BJ70	<b>\$35</b>
INCAN011	BC20 BLACK & HEAD	BJ4000 SERIES	<b>\$49</b>
INCAN012	BC21 COLOUR & BLACK	BJ4000 SERIES	<b>\$79</b>
INCAN013	BC121 BLACK	BJ4000 SERIES	<b>\$14</b>
INCAN014	BC121 C TRI-COLOUR	BJ4000 SERIES	<b>\$29</b>
INCAN015	BC22 PHOTO	BJ4200/BJ4500	<b>\$75</b>
INCAN016	BC22 PHOTO KIT	BJ4200/BJ4500	<b>\$95</b>
INCAN017	BC29F FLURO COLOUR	BJ4000 SERIES	<b>\$75</b>
INCAN018	BJ201B BLACK	BJ600 SERIES	<b>\$25</b>
INCAN019	BJ201C CYAN	BJ600 SERIES	<b>\$15.50</b>
INCAN020	BJ201M MAGENTA	BJ600 SERIES	<b>\$15.50</b>
INCAN021	BJ201Y YELLOW	BJ600 SERIES	<b>\$15.50</b>
INCAN022	BJ1642 BLACK	BJ300/330	<b>\$29</b>
INCAN023	BJ1643 BLACK	BJ800/880	<b>\$45</b>
INCAN024	BJ1643C CYAN	BJ800/880	<b>\$49</b>
INCAN025	BJ1643M MAGENTA	BJ800/880	<b>\$49</b>
INCAN026	BJ1643Y YELLOW	BJ800/880	<b>\$49</b>
INCAN027	BJ1801 BLACK	BJ80	<b>\$39</b>
INCAN028	BC03 BLACK	BJ210SP	<b>\$45</b>
INCAN029	BC60 BLACK	BJC7000	<b>\$59</b>
INCAN030	BC61 COLOUR	BJC7000	<b>\$69</b>
INCAN031	BC62 PHOTO COLOUR	BJC7000	<b>\$95</b>



## HP HEWLETT PACKARD

Code	Description	Printer compatibility	Price
INHPD000	HP51633M BLACK	HP PORTABLE	<b>\$49</b>
INHPD001	HP51626A BLACK	HP 500 SERIES	<b>\$49</b>
INHPD002	HP51629A BLACK	HP 600 SERIES	<b>\$45</b>
INHPD003	HP51645A BLACK	HP850C/1600	<b>\$49</b>
INHPD004	HP51640A BLACK	DJ 1200 SERIES	<b>\$45</b>
INHPD005	HP51606A BLACK	HP PAINTJET XL	<b>\$55</b>
INHPD006	HP51639A BLACK	PAINTJET XL300	<b>\$39</b>
INHPD007	HP51625A COLOUR	DJ500 SERIES	<b>\$49</b>
INHPD008	HP51649A COLOUR	HP 600 SERIES	<b>\$49</b>
INHPD009	HP51641A COLOUR	HP850C	<b>\$55</b>
INHPD010	HP51640C CYAN	DJ1200/1600	<b>\$49</b>
INHPD011	HP51640M MAGENTA	DJ1200/1600	<b>\$49</b>
INHPD012	HP51640Y YELLOW	DJ1200/1600	<b>\$49</b>
INHPD013	HP COLOUR PHOTO KIT	HP690C	<b>\$79</b>
INHPD014	HP 16A PHOTO INK	HP690/692/693	<b>\$59</b>
INHPD022	HP1823A COLOUR	HP720/890/1120	<b>\$59</b>

## EPSON

Code	Description	Printer compatibility	Price
INEPS003	SO20025 BLACK	400/800/1000	<b>\$35</b>
INEPS004	SO20034 BLACK	COLOUR/PRO/PROXL	<b>\$45</b>
INEPS005	SO20036 COLOUR	COLOUR/PRO/PROXL	<b>\$85</b>
INEPS006	SO20047 BLACK	200/820/11/115	<b>\$35</b>
INEPS007	SO20049 COLOUR	11/115/820/1500	<b>\$45</b>
INEPS008	SO20062 BLACK	STYLUS 1500	<b>\$65</b>
INEPS009	SO20066 COLOUR	STYLUS PRO XL+	<b>\$95</b>
INEPS010	SO20089 COLOUR	400/600/800/1520	<b>\$45</b>
INEPS011	SO20093 BLACK	C400/500/600	<b>\$35</b>
INEPS012	SO20097 COLOUR	C500/200	<b>\$49</b>
INEPS013	SO20108 BLACK	C800/1520	<b>\$45</b>

## Toner Cartridge

Code	Description	Printer compatibility	Price
TOHPD000	HP92295A	HP LASERJET II/III	<b>\$125</b>
TOHPD001	HP92274A	HP 4L/4ML/4P/4MP	<b>\$125</b>
TOHPD002	HP-C3906A	HP LASERJET 5L/6L	<b>\$105</b>
TOHPD003	HP92275A	HP IIP/IIIP/IIIP+	<b>\$149</b>
TOHPD004	HP92291A	HP 4SI/4SI MX/3SI	<b>\$220</b>
TOHPD005	HP-C3900A	HP 5SI/5SI MX	<b>\$325</b>
TOHPD006	HP92298Z	HP 4/4M/5/5N/5M	<b>\$165</b>
TOHPD007	HP-C3900A	HP 4V/4MV	<b>\$275</b>
TOHPD008	HP	HP 5P/5MP/6P/6MP	<b>\$145</b>



Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

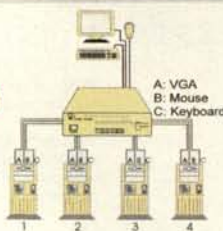
\*Please read our Terms and Conditions

**1800 626 345** FREE CALL



**CPU Switch****CS-102/104/106/128**

These CPU switches are useful for operating 2 to 8 computers from one keyboard, mouse and monitor. Ideal for administrators & those with more than 1 computer. Switching is done via an electronic button.



<b>Code</b>	<b>Model</b>	<b>Price</b>
DSADE030	<b>CS-102</b>	<b>\$245</b>
	2-port CPU Switch with AT mouse and keyboard support	

<b>Code</b>	<b>Model</b>	<b>Price</b>
DSADE019	<b>CS-104</b>	<b>\$395</b>
	4-port CPU Switch with PS/2 AT mouse and keyboard support	

<b>Code</b>	<b>Model</b>	<b>Price</b>
DSADE020	<b>CS-106</b>	<b>\$399</b>
	6-port CPU Switch with AT mouse and keyboard support	

**Cable Sets**

<b>Code</b>	<b>Model</b>	<b>Price</b>
CBGEN098	AT Cable Set	<b>\$35</b>
	(KeyBd M/M, Mouse M/F & Monitor M/F)	

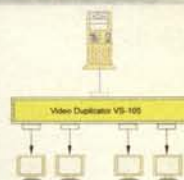
<b>Code</b>	<b>Model</b>	<b>Price</b>
CBGEN099*	PS/2 Cable Set	<b>\$39</b>
	(KeyBd M/M, Mouse M/M & Monitor SM/15F)	

<b>Code</b>	<b>Model</b>	<b>Price</b>
DSADE036	<b>CS-128</b>	<b>\$795</b>
	8-port CPU Switch with both PS/2 and AT mouse/keyboard support	
	*Requires special cables	

<b>Code</b>	<b>Model</b>	<b>Price</b>	<b>Code</b>	<b>Model</b>	<b>Price</b>
CBGEN127	AT Cable for CS-128	<b>\$39</b>	CBGEN128	PS/2 Cable for CS-128	<b>\$39</b>

**Data Switches****Video Splitter****VS-102/104/108**

These video splitters are the ideal solution for image duplication. Cascade ability allows infinite no. of VGA monitors to display the same image. Cable Required; 15pin M/15pin M



<b>Code</b>	<b>Model</b>	<b>Price</b>
DSADE000	<b>VS-102</b>	<b>\$89</b>
	2-port Video Splitter	

<b>Code</b>	<b>Model</b>	<b>Price</b>
DSADE001	<b>VS-104</b>	<b>\$89</b>
	4-port Video Splitter	

<b>Code</b>	<b>Model</b>	<b>Price</b>
DSADE002	<b>VS-108</b>	<b>\$195</b>
	8-port Video Splitter	

**Printer Switch**

Printer switch. 1 computer to connect to multiple printers.

<b>Code</b>	<b>Model</b>	<b>Price</b>
DSADE007	<b>4 Way Printer Switch</b>	<b>\$39</b>
DSADE021	<b>2 Way Printer Switch</b>	<b>\$25</b>

**Manual CPU Switch**

<b>Code</b>	<b>Model</b>	<b>Price</b>
DSADE028	2 to 1 Manual CPU Switch	<b>\$29</b>

<b>Code</b>	<b>Model</b>	<b>Price</b>
DSADE029	4 to 1 Manual CPU Switch	<b>\$39</b>

**Cables****PRINTER CABLES**

<b>Item Code</b>	<b>Description</b>	<b>Price</b>
CB-GEN000	1.8M PRINTER CABLE	<b>\$5.00</b>
CB-GEN002	5 METERS PRINTER CABLE	<b>\$12.00</b>
CB-GEN003	10 METERS PRINTER CABLE	<b>\$19.00</b>
CB-GEN089	1.8M IEEE1284 PRINTER CABLE	<b>\$20.00</b>

**DB25 CABLES**

<b>Item Code</b>	<b>Description</b>	<b>Price</b>
CB-GEN008	1.8M SERIAL DB25M/DB25M	<b>\$9.00</b>
CB-GEN010	5M SERIAL DB25M/DB25M	<b>\$17.00</b>
CB-GEN011	10M SERIAL DB25M/DB25M	<b>\$20.00</b>
CB-GEN013	1.8M SERIAL DB25M/DB25F	<b>\$9.00</b>
CB-GEN015	5M SERIAL DB25M/DB25F	<b>\$15.00</b>
CB-GEN016	10M SERIAL DB25M/DB25F	<b>\$17.00</b>
CB-GEN018	1.8M DB25F/DB25F	<b>\$9.00</b>
CB-GEN020	5M SERIAL DB25F/DB25F	<b>\$17.00</b>
CB-GEN021	10M SERIAL DB25F/DB25F	<b>\$20.00</b>

**KEYBOARD & VGA CABLES**

<b>Item Code</b>	<b>Description</b>	<b>Price</b>
CB-GEN023	1.8M KEYBOARD EXT M/F	<b>\$9.00</b>
CB-GEN025	5M KEYBOARD EXT M/F	<b>\$15.00</b>
CB-GEN026	1.8M CURLY KB EXT M/F	<b>\$10.00</b>
CB-GEN027	1.8M PS/2 KB EXT M/F	<b>\$12.00</b>
CB-GEN028	1.8M PS/2 KEYBOARD M/M	<b>\$12.00</b>
CB-GEN029	1.8M KEYBOARD CABLE M/M	<b>\$10.00</b>
CB-GEN030	1.8M EGA/MOUSE EXT 9F/9M	<b>\$9.00</b>
CB-GEN031	1.8M EGA/MOUSE 9M/9M	<b>\$9.00</b>
CB-GEN032	1.8M VGA EXT 15M/15F	<b>\$9.00</b>
CB-GEN036	MONITOR SPLITTER 15M/15F*2	<b>\$15.00</b>
CB-GEN037	1.8M RGB CABLE 15M/BNC*5	<b>\$25.00</b>

**SCSI PRODUCTS**

<b>Item Code</b>	<b>Description</b>	<b>Price</b>
CB-GEN042	1M CENT50M TO CENT50M SCSI	<b>\$15.00</b>
CB-GEN043	1.8M CENT 50M CENT 50M SCSI	<b>\$17.00</b>
CB-GEN044	1M CENT 50M/DB25M SCSI	<b>\$15.00</b>
CB-GEN045	CENT 50M SCSI TERM ACTIVE	<b>\$25.00</b>
CB-GEN046	CENT 50M TERM/C50M/C50F	<b>\$19.00</b>
CB-GEN047	1M HONDA 50M/CENT 50M	<b>\$25.00</b>
CB-GEN048	1.8M HONDA50M/CENT50M	<b>\$29.00</b>
CB-GEN049	1M HONDA 50M/DB25 SCSI II	<b>\$25.00</b>
CB-GEN050	1M HONDA 50M/HONDA 50M	<b>\$39.00</b>
CB-GEN051	1M HONDA 68M/HONDA 68M	<b>\$45.00</b>
CB-GEN052	1M HONDA 68M/HON 50M	<b>\$45.00</b>
CB-GEN053	1M HONDA 68M/CENT 50M	<b>\$45.00</b>
CB-GEN054	HONDA 50M TERMINATOR ACT	<b>\$25.00</b>
CB-GEN055	HONDA 68M TERMINATOR ACT	<b>\$39.00</b>
CB-GEN056	INTERNAL TERMINATOR ACT	<b>\$20.00</b>
CB-GEN057	INTERNAL SCSI III	<b>\$85.00</b>
CB-GEN060	INT SCSI CABLE 7 CONNECT	<b>\$15.00</b>
CB-GEN083	HONDA 68 TO DB25 M SCSI III	<b>\$45.00</b>

**NETWORKING**

<b>Item Code</b>	<b>Description</b>	<b>Price</b>
CB-GEN065	5M COAXIAL CABLE WITH BNC	<b>\$12.00</b>
CB-GEN066	10M COAXIAL CABLE WITH BNC	<b>\$15.00</b>
CB-GEN067	20M COAXIAL CABLE WITH BNC	<b>\$20.00</b>
CB-GEN070	BNC TERMINATOR	<b>\$3.50</b>
CB-GEN071	BNC T CONNECTOR	<b>\$3.50</b>
CB-GEN073	2M RJ45 CABLE	<b>\$10.00</b>
CB-GEN074	5M RJ45 CABLE	<b>\$15.00</b>
CB-GEN076	10M RJ45 CABLE	<b>\$20.00</b>

<b>Item Code</b>	<b>Description</b>	<b>Price</b>
CB-GEN077	15M RJ45 CABLE	<b>\$25.00</b>
CB-GEN078	20M RJ45 CABLE	<b>\$30.00</b>
CB-GEN080	30M RJ45 CABLE	<b>\$39.00</b>
CB-GEN081	40M RJ45 CABLE	<b>\$45.00</b>
CB-GEN084	2 METRE RJ45 CABLE-CROSS	<b>\$12.00</b>
CB-GEN087	10 METRE RJ45 CABLE-CROSS	<b>\$25.00</b>

**SCSI ADAPTERS**

<b>Item Code</b>	<b>Description</b>	<b>Price</b>
CB-GEN131	HONDA50F/CENT50M	<b>\$30.00</b>
CB-GEN132	HONDA50M/CENT50F	<b>\$25.00</b>
CB-GEN133	HONDA50F/CENT50F	<b>\$32.00</b>
CB-GEN134	HONDA50F/DB25M	<b>\$25.00</b>
CB-GEN135	GENDER CHANGER CEN50 F/F	<b>\$12.00</b>
CB-GEN136	HONDA68M/CEN50F	<b>\$35.00</b>
CB-GEN137	HONDA68F/CEN50M	<b>\$38.00</b>
CB-GEN138	HONDA68M/HONDA50F	<b>\$39.00</b>
CB-GEN139	HONDA68F/HONDA50F	<b>\$40.00</b>
CB-GEN140	HONDA68M/HONDA68F	<b>\$45.00</b>
CB-GEN141	HONDA68F/HONDA68F	<b>\$45.00</b>
CB-GEN142	INT. SCSI 50F/68F	<b>\$20.00</b>
CB-GEN143	INT. SCSI 50F/68M	<b>\$20.00</b>
CB-GEN144	INT. SCSI 50M/68F	<b>\$20.00</b>
CB-GEN145	INT. SCSI 50M/68M	<b>\$20.00</b>
CB-GEN146	INT. SCSI 50M/50F BRACKET ADAPTER	<b>\$20.00</b>
CB-GEN147	INT. SCSI 50M/68F BRACKET ADAPTER	<b>\$25.00</b>
CB-GEN148	INT. SCSI 50M/DB25 BRACKET ADAPTER	<b>\$20.00</b>
CB-GEN149	INT. SCSI 50F/68F	<b>\$30.00</b>
CB-GEN150	INT. SCSI 68F/68F BRACKET ADAPTER	<b>\$35.00</b>



# Digital Projectors



**They're ultra-powerful & ultra-portable. They're personal projectors that pack a big punch into a small package. Your presentations will be bright and vibrant!**

## DL450 Personal

### Projector



#### Power Zoom

The precision motorised zoom enables the adjustment of the image from 5 ft to 17 ft.

#### ultra light

The ultra light DL450 projector is compact and utilises the latest state-of-the-art micro optics projection technology.

#### Ultra-bright

Colours are saturated and vibrant with a resolution of 800 x 600. The 500-lumen imaging sets new standards in optical design.



#### Easy Plug-and-Play

Presentations will be up and running in no time with colour coded cables, simple set-up and auto-synching. The power zoom lets you adjust the image to the size required by remote control.

#### Image Quality

True-type colours with custom colour saturation. Detail is shown with an accurate grayscale. True-to-life images. Enhanced 3-D graphics. Depth with a high contrast ratio. Images that show up clearly with independent ambient light. Brightness with 500 ANSI lumens.



### DL450 PERSONAL PROJECTOR SPECIFICATIONS

- 4.5 kg weight
- 16.7 million colour palette
- Single-Chip DMD™ display
- 120-watt projection lamp
- 2000 hours lamp light
- 500 ANSI Lumens brightness
- 10-watt loudspeaker audio
- Full digital connectivity
- 800 x 600 resolution

**\$11,990**

MMDAV001

### POWERBEAM V DIGITAL PROJECTOR SPECIFICATIONS

- 8.5 kg weight
- 16.7 million colour palette
- Single-Chip DMD™ display
- 270-watt projection lamp
- 750 hours lamp light
- 500 ANSI Lumens brightness
- 2 x 6-watt stereo speakers
- 450 watt power consumption
- 800 x 600 resolution

**\$9,999**

MMDAV000

## Powerbeam V Digital Projector



Ultra brightness for distance audience. The colour view controls the brightness to 1,400 ANSI lumens to cover large audience groups.

#### DLP Quality

Award winning Digital Light Processing (DLP) technology to produce unmatched film-like quality and crisp, colour-saturated computer images. The graphical user menu allows you to point-and-click your way through every function. Powerbeam V is designed to show colour incredible 1400 lumens. The projector comes with the interactive remote control. This can be used as an on-screen pointer to toggle between image sources or to be a simple on-off switch.

#### Plug-&-Play Set-Up

Clearly marked cables and ports combine with projector-to-source auto-synching to make set-up truly simple and fast.

#### Power Zoom

The high-precision motorised zoom lens makes it simple to position the projector and adjust image sizes to fit your particular application. The zoom can be controlled by remote or the integrated touch pad.



#### Multiple Input Ports

The input ports allow simultaneous hook-up and the ability to toggle between ports. The Powerbeams TV Tuner Option allows you to connect directly to broadcast signals from a cable or satellite receiver.

#### Powerful Sound

A dedicated input for each source allows the stereo sound to follow the input signal, giving you high-impact multimedia presentations.

#### Slide Works Presentation Software

The Powerbeam V comes with software which gives you more than fifty powerful, easy-to-use presentation enhancements tools.

#### Colour Management

The Colour Management allows you to choose between four different projection modes; adjust for higher ambient light conditions, for darkened environments, extra colour saturation or a warm/cool colour control.

#### Multimedia Presentations

Services include animations, digitising of video and audio, photo CD productions, 3D modelling and video editing. All services are offered on multipatform standards.





## Software

## Microsoft

Code	Description	Price
SWMST070	Windows 98 CD New User	\$275
SWMST069	Windows 98 Upgrade CD	\$138
SWMST071	Microsoft Plus 98	\$65

## Microsoft Value Pack

Includes:  
Microsoft Office Pro. u/g,  
Encarta World Atlas,  
Greeting Workshop,  
Publisher 98,  
Money 98,  
Norton Anti-Virus,  
Microsoft Intellimouse

Code	Description	Price
SWMST043	Microsoft Value Pack	\$619

Code	Description	Price
SWMST007	Microsoft Office Pro Edition	\$815
SWMST008	Microsoft Office Pro Edition Upgr.	\$495
SWMST005	Microsoft Office Standard Edition	\$699
SWMST006	Microsoft Office Standard Edition Upgr.	\$375

## Microsoft FrontPage 98

Use Frontpage 98 to build quick, effective and professional looking websites. No knowledge of HTML or Java code needed.  
Great for both the beginner or professional web designer.

Code	Description	Price
SWMST020	Microsoft FrontPage 98	\$155
SWMST021	Microsoft FrontPage 98 Upgr.	\$85

Code	Description	Price
SWADD002	Adobe Illustrator 7.0	\$695
SWADD000	Adobe PageMaker 6.5	\$1075
SWADD005	Adobe Acrobat 3.0	\$325
SWADD006	Adobe Photoshop 5.0	\$1075
SWADD007	Adobe Photoshop 5.0 Upgr.	\$345
SWADD010	Adobe Premier 5.0	\$945
SWADD009	Adobe Premier 5.0 Upgr.	\$355

Code	Description	Price
SWGAM000	StarCraft	\$75
SWGAM001	Forsaken	\$85
SWGAM002	Annihilation	\$69
SWGAM003	Unreal	\$85

## SYMANTEC.

## WinFax PRO 8.0

WinFax Pro V8.0 provides hassle-free faxing, anywhere, anytime. Save time and money whilst getting laser quality faxes at home or in the office.

Code	Description	Price
SWSYM003	WinFax PRO 8.0	\$115

## pcANYWHERE

The fastest, easiest access to your office PC. From anywhere. Instantly access data and applications from your office computer from home or on the road.

Code	Description	Price
SWSYM004	pcANYWHERE	\$185

Code	Description	Price
SWSYM008	NORTON Utilities GOLD Edition	\$105
SWSYM007	Norton Anti-Virus 4.0 Gold Edition	\$89
SWSYM014	Norton Uninstall	\$55

## Microsoft Home Essentials

- Microsoft Word 97 • Microsoft Encarta® 98
- Microsoft Money 98 • Microsoft Works 4.5
- Microsoft Greetings Workshop

Code	Description	Price
SWMST051	Microsoft Home Essentials	\$169

## Microsoft Publisher 98

Publisher 98 is great for producing professional looking business desktop publishing newsletters, and figures.

Code	Description	Price
SWMST067	Microsoft Publisher 98	\$155
SWMST068	Microsoft Publisher 98 Upgr.	\$125

## Operating Systems

Code	Description	Price
SWMST003	Windows NT Workstation 4.0 - New user	\$469
SWMST004	Windows NT Workstation 4.0 - Upgr.	\$215
SWMST048	Windows NT Server 4.0 + 5 user	\$1190
SWMST044	Microsoft Project 98	\$215
SWMST045	Microsoft Project 98 - Upgr.	\$295
SWMST062	Microsoft Encarta 98	\$85

## Development Tools

Code	Description	Price
SWMST025	Visual Basic V5.0 Std Learning CD	\$139
SWMST063	Visual Basic V5.0 Pro	\$715
SWMST064	Visual Basic V5.0 Pro - Upgr.	\$375
SWMST065	Visual C++ V5.0 Std Learning CD	\$149
SWMST024	Visual C++ V5.0 Pro	\$695
SWMST066	Visual C++ V5.0 Pro - Upgr.	\$375

## Others

Code	Description	Price
SWGEM000	Infomagic LINUX 6 CD set	\$45
SWGEM001	Redhat Power tool 6 CD set	\$45
SWGEM002	LINUX - Official Redhat	\$79

## Quarterdeck

Code	Description	Price
SWQUA000	RealHelp Extra Strength	\$85
SWQUA001	Clean Sweep Extra Strength	\$75
SWQUA002	Partition It Extra Strength	\$85
SWQUA003	Virus Sweep Extra Strength	\$85
SWQUA004	Disk Clone	\$60
SWQUA005	Procomm Connections	\$169
SWQUA006	Remove-It 98	\$35

## MYOB

## M.Y.O.B. Accounting 8.0

Provides everything we expect to find in a high quality accounting package such as General Ledger, Chequebook, Acc. Receivable and Inventory Control.

Code	Description	Price
SWMY001	Accounting 8.0	\$325
SWMY002	Accounting with Payroll	\$489
SWMY003	Premier Accounting	\$880

## M.Y.O.B. First Accounts

Outgrown Quicken or MS Money? Then M.Y.O.B. First Assets is for you. Track income & expenditure, print invoices and produce key graphs with this package.

Code	Description	Price
SWMY000	FirstAccounts	\$165
SWMY004	Asset Manager	\$255

Free for 1 year

Code	Description	Price
SWCYB002	<b>Vet Net Surfer</b> • Unlimited phone and email support • Unlimited access to updates on-line	\$89
SWCYB000	<b>Vet Premium</b> • Unlimited phone and email support • Unlimited access to updates on-line • Updates mailed quarterly direct to your home or office	\$119
CODE	<b>Vet Net Surfer 98</b> • Protection for Windows 98 • Supports Web upgrades	\$79



## vet Anti-Virus Software



**100% "In the Wild" Virus Detection**  
**Automatic Virus Protection For All Platforms**

Vet automatically detects and cleans conventional file and boot sector viruses as well as macro viruses which infect Word documents and Excel spreadsheets. Protecting your PC from web sites around the world, and from infected attachments sent to you via e.mail. Unlimited access to the web site update service for 1 year.



# Software



Adelony Computers

## Artist

**The easiest, most natural way to create, edit and publish your images**

- Fast and Accurate Photo Editing
- Over 30 Stunning Effects!
- Intelligent Drawing Tools
- Be Creative Naturally!
- Internet Ready Images!

SWEAS017 **\$29**



## Explorer

**The World's Best Organiser!**

- Quickly View Your Images!
- Easy Printing!
- Create Your Own Catalogues!
- Convert Your Images!
- Instant Search!
- Your Own Photo Web Site!
- Work Like a Pro!

SWEAS008 **\$29**



## PHOTO Scanner Suite

**The World's Best Photo Software for Scanners!**

- Instant Photo Web Pages
- Catalogue and Store Photos
- For Home and Business
- Editing and Effects

*\*All Popular Scanners Supported*

SWEAS009 **\$59**



## DIGITAL Camera Suite

**The World's Best Software for Digital Cameras!**

- Instant Photo Web Pages
- Catalogue and Store Photos
- For Home and Business
- Editing and Effects

*\*All Popular Digital Cameras Supported*

SWEAS010 **\$59**



## Dragon Naturally Speaking Preferred

**Continuous Speech Recognition**

- True Continuous Speech
- Immediate Recognition
- Even Higher Accuracy
- Use with virtually any Windows application
- Integrated with Microsoft® Word 97 and Corel® Wordperfect® 8
- Natural language commands™
- New, larger vocabulary
- Text-To-Speech
- Dictation Playback
- Learns your voice
- Hands-free editing
- Text shorthands
- Dictate on the move

SWEAS003 **\$329**



## Dragon Naturally Speaking Standard

**The fastest way to put thoughts on paper!**

- True Continuous Speech
- Immediate Recognition
- Even Higher Accuracy
- Use with virtually any Windows application
- Integrated with Microsoft® Word 97 and Corel® Wordperfect® 8
- Natural language commands
- New, larger vocabulary
- Learns your voice
- Hands-free editing
- Text shorthands

SWEAS004 **\$229**

## Voice Xpress

**\*Dictate, Format, and Edit As Fast As You Speak!**

**\*Continuous Speech Technology**

**\*Natural Language Technology**

- Accomplish tasks faster by "typing" at up to 140 words per minute.

- Use Natural Language Technology to command the L&H Voice Xpress word

processor making formatting and editing easier to accomplish.

- Interact with your computer in a more natural way, making work fun!

SWEAS005 **\$175**



## Voice Xpress Plus

**\*Dictate, Format, and Edit As Fast As You Speak!**

**\*Continuous Speech Technology**

**\*Natural Language Technology**

**\*Voice Power for Microsoft® Word**

- Accomplish tasks faster by "typing" at up to 140 words per minute.

- Maximise the use of Microsoft® Word by accessing previously unknown or complicated functions.

- Use Natural Language Technology to command Microsoft® Word and the L&H Voice Xpress word processor making formatting and editing easier to accomplish.

SWEAS006 **\$279**



**From Your Lips  To Your PC's Screen**

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday  
Technical Support (5 Days a week 9am-6pm) Phone (02) 9700 9354



RESELLER ENQUIRIES WELCOME

\*Please read our Terms and Conditions

**1800 626 345 FREE CALL**



## Customer Service

## Commonly asked questions

**What do I do if my order is late in arriving?**

Ring the Sales Representative with whom you have originally placed the order. Quote your order number or full name of the person or company who purchased the items. We first have to establish if the goods were sent out or not. If not, the product is temporarily out of stock and the up-to-date delivery time may be obtained from your sales representative. If the product has been sent out already, the problem will be with the carrier. You will then be transferred to the Dispatch Representative who will take your details, contact the carrier and then call you back.

**What do I do if my product has been damaged during delivery?**

If your product has been damaged, our warranty manager may issue you with a returns number and arrange the collection and replacement. Please note that the collection and replacement may not be on the same carrier visit.

**What do I do if I have received an incorrect product?**

Ring the sales representative with whom you have originally placed the order. Discuss the problem with the Sales Representative to

check if it is our misunderstanding. If it is our misunderstanding, we will pass your call through to the Warranty manager who will issue you with a returns number and arrange collection and replacement of the product.

**What do I do if the courier arrives but the consignment note mentions more boxes than are being received?**

Cross out the number of items listed and change it to read the appropriate number received. Ring your Sales Representative to contact the courier and to keep you informed.

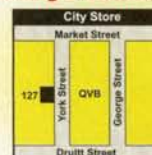
**What if my product won't work?**

If you have our 3 year on-site warranty, call 1 800 623 394. If the problem is diagnosed as a software problem ring (02) 9700 9354 for a Technical Support Representative. Please call with the product on hand to evaluate any suggestions. Technical Support will give you. If you do not have our 3-year on-site warranty, contact Technical Support. If your product has been diagnosed as faulty you will be issued with a returns number. Your Technical Representative will then arrange the collection process with you. Please note the RA # for future questions on the progress of your case.

## Important points to remember

- A returns authorisation number must be obtained before the return of any product.
- Failure to display the number will result in the return being refused.
- The package must not be delayed in any way and must be securely packaged.
- A returns number is valid for 14 days only.
- If a fault is found a replacement will be sent to you by return.
- No opened software packages will be accepted back.  
(please check details on the box before opening).
- Warranty repairs - carriage must be paid for by the customer.
- We offer the full manufacturers "dead on arrival" and warranty to our customers.

## Adelong's locations for your convenience



## Free Nation Wide Delivery\*

\*APPLICABLE ONLY TO ORDERS OVER \$500 AND UNDER 2KGS

SYDNEY METRO .....	\$6.00 (20KG LIMIT)
NSW, ACT, VIC & QLD .....	\$10.00 (5KG LIMIT)
W.A, N.T, S.A & T.AS .....	\$15.00 (5KG LIMIT)
EXCESS WEIGHT .....	\$2.00 PER KG

OUR AVERAGE DELIVERY TIMES ARE BETWEEN 1-2 WORKING DAYS. HOWEVER DUE TO THE REMOTENESS OF CERTAIN PARTS IN W.A, N.T, TAS AND S.A, DELIVERY MAY TAKE UP TO SEVEN WORKING DAYS.

Ansett Air Freight Enquiries: 132 767

RentSmart Finance Enquiries: 1800 688 777

Warranty Assistance Australia: 1800 623 394

Free  
Insurance  
on Freight

## DIRECT DEPOSIT

ANZ BANK  
CNR YORK & MARKET ST SYDNEY  
NSW 2000  
BSB 012172 A/C 2599 49 784  
ADELONG COMPUTERS  
PLEASE FAX DEPOSIT RECEIPT ASAP  
AFTER TRANSACTION

## TERMS &amp; CONDITIONS

All orders are subject to our full terms and conditions of sale, a copy of which is available upon request. Although we take every reasonable precaution, due to the volume and diversity of the products that we carry, we do not accept liability for any errors in pricing or descriptions. Due to the nature of this catalogue, pricing and stock availability is subject to change at any time without notice. All pricing listed includes sales tax, unless otherwise stated. Delivery is in addition to listed prices, unless otherwise stated. Please note that pictures and illustrations are for display purposes only and that the final product may vary. All products, brand names, trademarks and registered trademarks are owned by their respective companies.

**ORDERING & PAYMENT:** We accept payment by Bankcard, Mastercard, Visa, Amex and Eftpos. All company/personal cheques and direct deposits are subject to seven working days clearance. Goods ordered by fax or post will be charged at the current price on the day of receipt. Orders can be made by phone, fax or by visiting one of

our showrooms. We now have a facility where customers can order their goods instantaneously through our web site. Although this is becoming a relatively safe way to shop, customers who use this facility do so at their own risk.

**CREDIT ACCOUNTS:** Accounts may be opened for Govt. Depts, Education and selected incorporated businesses, subject to status. Credit account orders are only accepted on official stationary by fax or post. We reserve the right to withdraw credit facilities.

**WARRANTY AND RETURNS:** All computer systems come with a seven day customer satisfaction guarantee, of which shipping charges to and from the customer are not refundable. Orders are refundable, subject to final inspection of goods by Adelong Computers. We reserve the right to stipulate that our warranty on PC's and Parts overrides all other warranties that might be stated by the manufacturers.

Company: \_\_\_\_\_  
Address: \_\_\_\_\_ Postcode: \_\_\_\_\_  
Telephone: ( ) \_\_\_\_\_ Fax: ( ) \_\_\_\_\_

Code	Description	Qty	Price
Month	Total		

Payment by: Cheque ☐ Mastercard ☐ Bankcard ☐ Visa ☐ Amex ☐

Exp  /  /  Card No:

## Please fax or mail this form back to Adelong Computers

45-47 Ralph Street, Alexandria NSW 2015

Fax: (02) 9669 3216

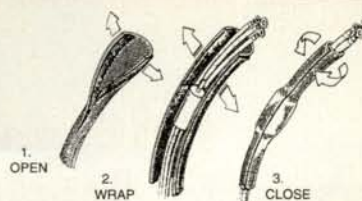
Signature: \_\_\_\_\_





## Flexo-Wrap is

Durable - Flexible -  
Expandable - Affordable - Re-Usable  
As Easy As One, Two, Three



The **Flexo-Wrap** Cable Management System is simply the best way to organize your cabling for a safer environment. The easy wrap harness assembly allows easy access for harness rework without disrupting existing connections, or routing sleeving over the entire bundle.

DEALERS WELCOME

- Ideal For Networking
- Ideal For Easy Access to Cabling
- Organise & Protect Cables
- Custom Made Lengths are Available



**TECHFLEX** AUSTRALIA

Tel: (02) 9709 2445 Fax: (02) 9793 7350 [www.techflex.atu.com.au](http://www.techflex.atu.com.au)

## Diskette Duplication and CD Replication

Consider the advantages of using one supplier for all your software needs...

- Disk Duplication
- Printing of Manuals & Boxes
- Corporate Logo Printing for diskette & CD-R
- Label Printing
- Software Packaging & Product Fulfillment
- MediaForm Duplication Equipment for Disk and CD-R

■ CD-R Replication - Data or Audio	1 - 9	\$13.00
	10 - 19	\$11.70
	20 - 49	\$10.70
	50 - 100	\$8.50
	100+	\$7.70
	200+	\$5.65

All prices include quality Japanese CD-R media, 1 colour print, jewel case and Sales Tax.

A once only mastering fee of \$25.00 for DAT Audio / \$50.00 for HDD applies.

- CD-R Package Deals - CD-R / screen print / colour inserts.
- CD-R Media - Can be supplied printed with up to 5 colours.
- CD Pressing - For quantities larger than 200 call for prices



**INDEPENDENT SOFTWARE DUPLICATION**

Unit 22/7 Packard Avenue, CASTLE HILL NSW 2154 AUSTRALIA

Phone: (02) 9899 4044 Fax: (02) 9899 4085 Email: [isdup@compuserve.com](mailto:isdup@compuserve.com)

Continuing excellence  
since 1984



## ACCISOFT INTERNET SERVICES

\$2/hr casual access (prepaid, no use-by date)  
\$1/hr for heavy access (16hrs/week)  
\$38/mth untimed access \*

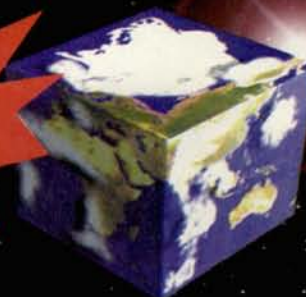
### Business Total Connect \*

24x7, Fast Reliable, [COMPANY.com.au](http://COMPANY.com.au)  
E-mail gateway, web site hosting  
Analogue from \$200/mth  
Digital from \$350/mth  
ISDN from \$500/mth

### I100 \*

Phone-to-phone  
International  
Telephony  
Services

56K  
V.90  
(and K56Flex)\*



## Simply Experience The Difference

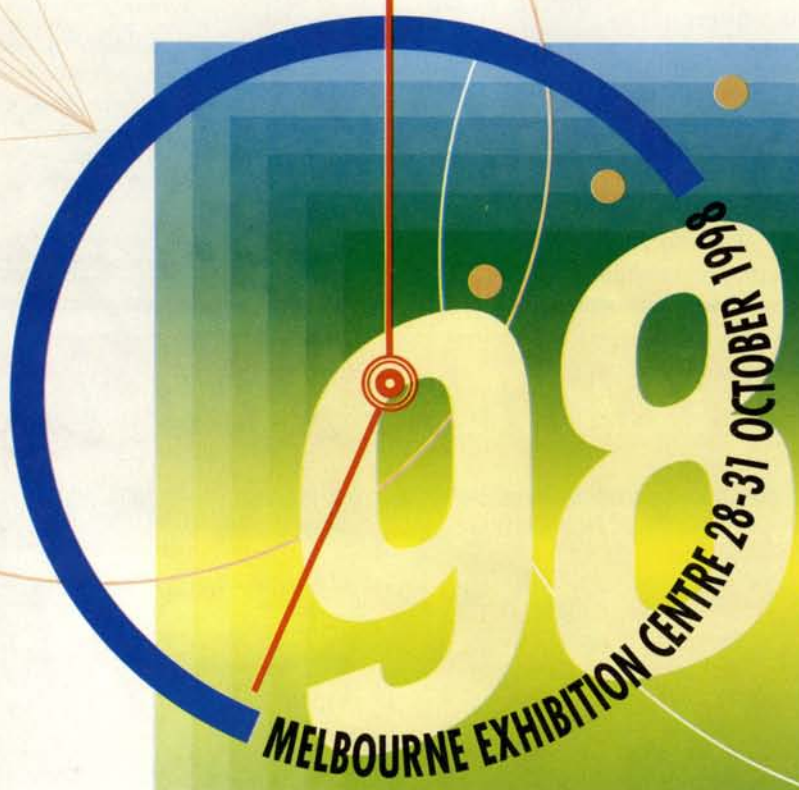
POPs in Sydney, Melbourne and Brisbane

Suite F1 Citymark Building, 683-689 George St, Sydney, NSW 2000  
Tel: (02) 9281 8163 Fax: (02) 9281 8621 <http://www.accsoft.com.au>

\* Please check our web site or ring for coverage and service details



# Interact and PC IT combine to create Australia's largest IT exhibition



## Interact + PC IT



- Computer Hardware
- Software Solutions
- Multimedia
- Internet
- Networking
- Y2K Pavilion
- CADWorld
- Conference & Seminar programme

## Melbourne Exhibition Centre 28-31 October 1998

■ Wednesday 11am-7pm ■ Thursday 10am-9pm **LATE NIGHT** ■ Friday 10am-7pm ■ Saturday 10am-5pm  
■ Business Visitors Welcome. Persons including children not in this category will not be admitted.



Australian Exhibition Services Pty Ltd Tel: (03) 9261 4500 Fax: (03) 9261 4545  
<http://www.ausexhibit.com.au> E-mail: [Shows@ausexhibit.com.au](mailto:Shows@ausexhibit.com.au)

COCKLE 4223



*Windows 98 is finally on the streets, and the first raft of supporting literature has arrived too.*

## Windows 98

### Windows 98 at a Glance, Windows 98 Instant Reference

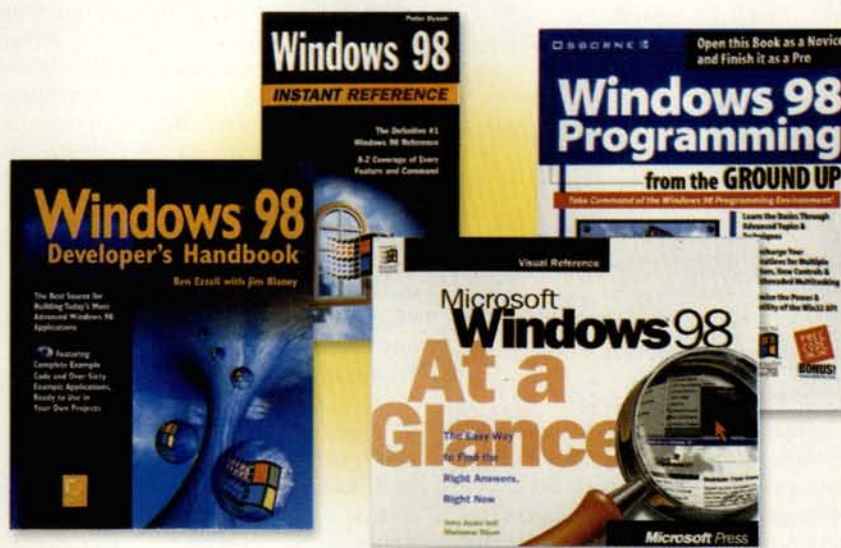
In the final analysis, very few people want to read several hundred pages about an operating system. That's especially the case with Windows 98, which doesn't require the same switch to an entirely new interface as its predecessor, Windows 95.

What can be useful in making a transition to a new OS is an easily thumbable reference guide, one that quickly lets you find the answers to such burning questions as 'How do I get back to using double-clicking?' or 'How do I check if my drivers are working?'

While we at APC would unashamedly recommend our own *Windows 98 Pocketbook* for such a task, many publishers are also vying for a position in this niche. Both *Windows 98 at a Glance* and *Windows 98 Instant Reference* aim to be handy desk-top references, but approach their common subject matter in slightly different ways.

*Windows 98 at a Glance* comes from the increasingly busy team at Microsoft Press. This is of course something of a double-edged sword; while authors of an 'official' guide should get better access to software and technical expertise, there's always the risk that they'll sugarcoat less appealing aspects of the OS. That suspicion is confirmed when you read the following sentence in the introduction, explaining why there's no section on installing the OS: "The Setup Wizard makes installation so simple that you won't need our help anyway." The many users who have experienced 98 installation woes (reported in Newswire in this issue) might feel otherwise.

That said, the layout of *At a Glance*, which presents common tasks across a



double page with copious illustrations, is easy to read and simple to use. The 300-odd paged volume is divided into 15 chapters based around broad themes such as desktop customisation and working with networks. The unusual page format — a landscape volume slightly smaller than A4 size — is well used, but keeping the book open at a specific page while you work through a task isn't always easy.

*Windows 98 Instant Reference* takes a slightly different approach, offering a brief overview of new features in the OS followed by an alphabetical guide to key concepts and functions with Windows 98. Some of the explanations offered are much more concise than those offered by *At a Glance*, which is handy if you just want to check something quickly. With a size similar to a paperback novel, it also has portability advantages over *At a Glance*.

The disadvantage of its approach is that if you're not *au fait* with Windows ter-

minology, then finding the topic you want isn't always straightforward. For instance, the Web server functionality built into 98 is discussed under the name of the product, Personal Web Server, rather than under 'Web server', where you might reasonably expect to find it.

Given each book's stated intention of being a reference tool, the efficiency of their indexes plays a crucial role. In this area, *At a Glance* definitely comes out ahead. Take the example given above of how to switch between single and double-clicking. *At a Glance* has no entry for 'single-clicking', but it does have an entry

### Guide to ratings

- ★ Australia — failed to qualify
- ★★ Scotland — made it to Stage 1
- ★★★ England — good enough for Stage 2
- ★★★★ Brazil — challengers for the final
- ★★★★★ France — Allez! Ola! Ole!



under 'mouse-clicking' and cross-references under 'double-clicking' and 'clicking', all of which will lead you to the required information. By comparison, *Instant Reference* only has an entry for 'double-clicking', and this doesn't point to any information about switching between these two modes.

#### Angus Kidman

■Title	Windows 98 at a Glance
■Authors	Jerry Joyce and Marianne Moon
■Publisher	Microsoft Press
■Distributor	McGills
■Phone	(03) 9602 5566
■Price	\$39.95
■ISBN	1-57231-631-4
■Rating	★★★★

■Title	Windows 98 Instant Reference
■Authors	Peter Dyson
■Publisher	Sybox
■Distributor	Addison Wesley Longman
■Phone	(02) 9428 8066
■Price	\$39.95
■ISBN	0-7821-2191-8
■Rating	★★★

### The Windows 98 Developer's Handbook

For developers, the coming of Windows 98 translates to more functions and APIs that have to be mastered to keep ahead of the game. Programs will soon be expected to support multithreaded displays and use the new Windows 98 controls. If you're a Windows 95 pro-grammer looking to learn

about Windows 98, and you come across the *Windows 98 Developers Handbook*, put it down and run!

It isn't a bad book by any means. It is, however, huge. Moving from Windows 95 to Windows 98 is not a giant leap for a programmer. Moving from ANSI C to programming with the MFCs (Microsoft Foundation Classes), on the other hand, is an enormous step. And it is this audience — C programmers with no Windows development knowledge — that will benefit most from this book.

Contained within its 1,300 or so pages is all the information a well-versed C programmer would need to start programming for the Windows environment. Beginning with the obligatory WinHello program, the book does a nice job of introducing the basics of Windows programming, including initially confusing details, such as the naming conventions of the Windows APIs.

Although the book has humble beginnings, it is very complete, and goes on to cover more advanced topics, such as OLE client/server development. It provides just enough information without any waffle.

Travis Simon

■Authors	Ben Ezzell and Jim Blaney
■Publisher	Sybox
■Distributor	Addison Wesley Longman
■Phone	(02) 9428 8066
■Price	\$129.95
■ISBN	0-7821-2124-1
■Rating	★★★★☆

### Windows 98 Programming from the Ground Up

More and more these days, programmers are learning C as their first language. Unfortunately, text based programming can quickly become very tedious. The next step, then, is to program for GUIs. And for most, this means learning to write Windows-based applications.

*Windows 98 from the Ground Up* aims to teach novice C programmers the mysteries of the WinAPI. It is shorter than *Windows 98 Developer's Handbook* — barely reaching the 800-page mark.

The reduced page count can probably be attributed to the author's writing style. Herbert Schildt takes the sink-or-swim approach to teaching programming. A minimum amount of information is given before the author moves on to other concepts. Each paragraph must be read fairly attentively, as important concepts are usually not reiterated.

If you prefer the quick and concise style of explanation with long examples, you will probably learn a great deal from this book.

Travis Simon

■Author	Herbert Schildt
■Publisher	Osborne McGraw-Hill
■Distributor	McGraw-Hill
■Phone	(02) 9417 4288
■Price	\$64.95
■ISBN	0-07-882306-4
■Rating	★★★

### Off the Shelf

Title	Author(s)	Publisher	Distributor	Phone	Price	ISBN
10 Minute Guide to Windows 98	Jennifer Fulton	Que Development Group	Prentice Hall Australia	(02) 9454 2200	\$21.95	0-7897-1509-0
ABCs of Windows 98	Sharon Crawford, Neil Salkind	Sybox	Addison Wesley Longman	(02) 9428 8000	\$39.95	0-7821-1953-0
Complete Idiot's Guide to Windows 98	Paul McFedries	Que Development Group	Prentice Hall Australia	(02) 9454 2200	\$34.95	0-7897-1493-0
Mastering Windows 98	Robert Cowart	Sybox	Addison Wesley Longman	(02) 9428 8000	\$89.95	0-7821-1961-1
Microsoft Windows 98 Companion	Martin Matthews	Microsoft Press	Woodslane	(02) 9970 5111	\$69.95	1-57231-931-3
Windows 98 Black Book	James Stewart, Amy Horowitz	The Coriolis Group	Woodslane	(02) 9970 5111	\$89.95	1-57610-265-3
Windows 98 for Busy People	Ron Mansfield, Peter Weverka	Osborne/McGraw-Hill	McGraw-Hill Australia	(02) 9417 4288	\$36.95	0-07-882398-6
Windows 98 No Experience Required	Sharon Crawford	Sybox	Addison Wesley Longman	(02) 9428 8000	\$49.95	0-7821-2128-4



# MicroGram Computers

## PCMCIA Video Capture Card



PCMCIA Video Capture card complete with software. Designed to provide smooth, full-motion video for applications such as Video Mail, Video Conferencing or Full-Motion Video Capture to AVI file format. The Video Capture card is WIN 95/98 compatible for easy installation & setup. Provides 640 x 480 resolution with 30fps capture rate.

Cat. 3375 **PCMCIA Video Capture Card** \$739

## VGA Monitor Splitters

These splitter modules enable up to 16 monitors to share the same information of a host PC simultaneously. The ideal way of providing multiple displays in training rooms, airport terminals, stock rooms, clubs, etc. The splitter may be up to 15m from the computer while the monitor may be up to 100m from the splitter for the 2 way module & up to 50m for 4, 8, 12 & 16 way modules. They are suitable for VGA, Super VGA and XVGA monitors.



Cat. 3070	<b>VGA Splitter 2 Way</b>	\$269
Cat. 3055	<b>VGA Splitter 4 Way</b>	\$336
Cat. 3056	<b>VGA Splitter 8 Way</b>	\$574
Cat. 3349	<b>VGA Splitter 12 way</b>	\$750
Cat. 3350	<b>VGA Splitter 16 way</b>	\$900

## PCI Plug & Play Serial Cards

Provide 4 RS232 Serial ports with 16650 UARTs (32Byte FIFO buffer). Data transfer rate is from 50 to 921,600 Baud. The I/O address is set automatically and the IRQ is set by the motherboard, the ports share one IRQ. Drivers are provided for Win 95/98 and Win NT4.x/5.x. An adapter cable with four DB25F connectors is included.

Cat. 2616	<b>1 Port RS232 16650 PnP PCI</b>	\$185
Cat. 2617	<b>2 Port RS232 16650 PnP PCI</b>	\$225
Cat. 2656	<b>4 Port RS232 16650 PnP PCI</b>	\$425
Cat. 2657	<b>8 Port RS232 16650 PnP PCI</b>	\$699

## 4 Port USB Hub



A self powered USB hub that has one up-stream port & four down-stream ports. It supports both full speed (12M bps) and low speed (1.5M bps) devices & is compatible with the USB 1.0 Specification. It also supports both self-powered & bus-powered modes. It has overcurrent detection & power ready LEDs for each port.

Cat. 2628 **USB Hub 4 Port** \$169

## 10/100Mbps Ethernet Cards

Able to auto sense either 10Mbps or 100Mbps operation, this PnP PCI Ethernet card uses the Bus Master architecture to maximise throughput.

Cat. 11282	<b>Ethernet Card PCI UTP/STP 10/100Mbps</b>	\$59
Cat. 11271	<b>Ethernet Card PCI BNC UTP/STP</b>	\$39

## Web-Based Training from \$9.95 per month\*

Learn about *Microsoft Office, Word, Access, Excel, Windows 95, FrontPage, C++, HTML, Internet Explorer, Windows NT* and more!

A number of courses are "Microsoft Certified Professional - Approved Study Guides"

\*Full details at [www.tol.com.au](http://www.tol.com.au)

Over 160 courses on offer

Cat. 11272 **Ethernet Card ISA BNC/UTP PnP Jmp** \$39

## Serial to Fibre Optic Converter



The fibre optic converter allows serial input signals to be converted to fibre optic signals for long distance, high speed and high quality communication. There are 3 LED indicators which correspond to Rx, D, CTS and power signals.

Cat. 15074	<b>RS422/485 to Fibre Optic Converter</b>	\$499
Cat. 15073	<b>RS232 to Fibre Optic Converter</b>	\$499

## 100Mbps Ethernet 5 Port Hub Card

Mounts on the back plane of a computer but does not plug into a slot, it only connects to the power supply. No separate case and power supply means reduced costs, plus everything is kept neat & tidy inside the computer.

Cat. 11294	<b>Ethernet Hub Card 5 Port UTP 100Mbps</b>	\$259
Cat. 11287	<b>Ethernet Hub Card 5 Port UTP 10Mbps</b>	\$99

## 10Mbps Ethernet 5 Port Hub & LAN Card

Internal PCI Plug & Play 5 Port hub and LAN card does not require external power supply and is a cost effective solution for SOHO users. One port can be used as an uplink port for easy expansion, or used for hub connectivity at the server.

Cat. 11295 **Ethernet Hub & LAN Card 5 Port UTP 10Mb** \$109

## Active Noise Cancellation

Active Noise Cancelling Technology cancels background noise before it's recorded. A must for Speech Recognition. In fact, most speech recognition software programs bundle a passive noise cancellation microphone. Active is even more effective. It's also better for Internet Telephony & Interactive Gaming.



Cat. 3377	<b>Headset / Desktop - Ear &amp; Mic ANC100</b>	\$72
Cat. 3379	<b>Headset - Ear (Either) &amp; Mic ANC500</b>	\$78
Cat. 3380	<b>Headset - Ear &amp; Mic (Stereo) ANC550</b>	\$110
Cat. 3381	<b>Headset - Ear &amp; Mic (Disconnect) ANC600</b>	\$125

## PCMCIA BAR CODE WAND

Turn your handheld PC into a powerful data collection terminal. Plug the card into your handheld PC (H/PC), launch keyboard emulation software and you can use the pen-like contact scanner wand to copy bar code data directly into any Windows CE program.

Cat. 8672 **PCMCIA Bar Code Wand** \$1015

## 100 Mbps Network Starter Kit

This SOHO Network Starter Kit contains two 10/100Mbps PCI Ethernet cards, one 4 Port 100BaseTx hub, two 5 metre cables & detailed installation manual.

Cat. 11900 **Network Starter Kit** \$349

## Year 2000 BIOS Card

Even Pentium motherboards are not immune to the Year 2000 bug! The Year 2000 BIOS Card solves the problem of progression from 1999 to 2000 as well as 21st century leap years. It is an 8-bit card which provides year 2000 support for motherboards with a BIOS which only stores the year with two digits. i.e. 97 instead of 1997.

Cat. 3359 **Year 2000 BIOS Card** \$129

## "Buddy" - Two Users - One PC

Add a second user to your PC. Two users can now concurrently access one PC. Even share one modem & one ISP account! Total Cost of Ownership is much lower & more cost-effective.



Cat. 11639 **VGA PC Share Simultaneously Buddy** \$599

## Bar Code Slot Reader

An alternative to magnetic card readers (no expensive card writer is required). Ideal for club membership cards etc. A bar code is affixed to the membership card & the card swiped through the reader. It is a keyboard wedge model & the decoder is built-in.

Cat. 8562	<b>Bar Code Slot Reader KB Wedge</b>	\$459
Cat. 8563	<b>Bar Code Slot Reader Serial</b>	\$459

## Converter SVGA to RGB

Allows the use of an RGB monitor with either VGA or SVGA output. It is designed for high resolution graphics monitors & has H and V sync signals added to the Green video channel. RGB to SVGA converters are also available.

Cat. 15063	<b>SVGA to RGB Converter</b>	\$189
Cat. 15064	<b>RGB to SVGA Converter</b>	\$194

E & OE All prices include sales tax **MICROGRAM 0998**

**Come and visit our online catalogue & shop at [www.mgram.com.au](http://www.mgram.com.au)**

Phone: (02) 4389 8444

[sales@mgram.com.au](mailto:sales@mgram.com.au)

[info@mgram.com.au](mailto:info@mgram.com.au)

Fax: (02) 4389 8388

**Dealer Enquiries  
Welcome**

**Australia-Wide Express Courier (To 3kg) \$10**

We welcome Bankcard Mastercard VISA Amex  
Unit 1, 14 Bon Mace Close, Berkeley Vale NSW 2261

**Web site:  
[www.mgram.com.au](http://www.mgram.com.au)**

FreeFax 1 800 625 777

Vamtest Pty Ltd trading as MicroGram Computers ACN 003 062 100

FreeFax 1 800 625 777



## Perspective: A war of words

### Leveraging the New Infrastructure: How Market Leaders Capitalize on Information Technology

The notion that information technology must deliver added competitive value, rather than merely increasing technical capacity, is likely to be familiar to anyone working in business. However, IT managers who combine technical know-how with business savvy are a particularly rare breed, and tried-and-tested systems for measuring the total contribution of IT assets to a corporation's bottom line are equally uncommon.

*Leveraging the New Infrastructure* aims to fill the latter gap, providing a detailed examination of the different ways in which businesses use information technology to enhance their competitiveness and how these can be measured. Co-authored by two academics from Melbourne Business School, Peter Weill and Mariane Broadbent (Broadbent has since left for an analyst position at Gartner), the book draws heavily on eight years of case studies with 100 companies across the world to provide methodologies for assessing the value of IT to a business.

The authors stress throughout the text that IT should be considered as an investment, rather than merely capital expenditures. The main focus, as the title suggests, is on the development of an information infrastructure that can service current and future business goals.

Weill and Broadbent identify four key views of IT infrastructure within a firm: a complete absence of any firm-wide infrastructure; a utility view of infrastructure where IT is used to generate cost savings via economies of scale; a dependent view, where an infrastructure is built in response to a specific broad business strategy; and an enabling view, where IT infrastructure is viewed as a core competency of the business and continually evolves.

Matching the infrastructure type with the business' long-term goals is essential to leveraging maximum value. For instance, a firm that plans to extend through acquisition and lets each business unit operate independently will benefit most from a

low-level infrastructure view, while companies that need to quickly respond to market conditions with new products (such as financial institutions) require an enabling view of IT to remain competitive.

Along with numerous examples from case studies, the book also provides handy checklists of questions businesses can use to determine their current IT strategy, identify misalignments with overall business strategy, and calculate returns on investment.

*Leveraging the New Infrastructure* is not light reading in the fashion of a populist text on business success, but it does provide stimulating food for thought for anyone involved in the impact of IT investment decisions. While its conclusions

are based on research in large firms, many of its lessons should prove useful to businesses of all sizes.

Angus Kidman

■ Authors	Peter Weill and Marianne Broadbent
■ Publisher	Harvard Business School Press
■ Distributor	McGraw-Hill
■ Phone	(02) 9417 4288
■ Price	\$59.95
■ ISBN	0-87584-830-3
■ Rating	★★★★

### Life by the Numbers

Maths and mathematicians don't have the best of reputations. Generations of school students have grown up regarding maths as something to be avoided, something for nerds. Very few of them — of us — appreciate the beauty and power of maths, but *Life by the Numbers* helps fill that gap.

Produced as a companion to a US TV series of the same name, the book looks at some of the varied ways maths is put to interesting use in the modern world. For example, "the film industry is one of the largest employers of mathematicians in the world", thanks to the maths underlying the digital special effects with which we are now so familiar.

Perhaps more surprising are the biological applications. Why do humans and other mammals vary their gaits when moving at different speeds? The answer, it's

suggested, lies in the strength of bone. When a movement stresses bones to around 30% of their breaking stress, the creature changes gait. This analysis can be reversed to suggest how dinosaurs may have moved. Then there's knot (as in pieces of string) theory. It turns out that viruses work by creating an enzyme that causes the host's DNA to knot, allowing the virus to reproduce itself. Understanding knots in the abstract helps fight diseases.

The America's Cup is extensively covered in this country, so there's a general, if vague, awareness that there's a lot of maths behind the design of the boats; but mathematicians play a part in other sports too. The triple axel became part of ice skating competition during the 1980s, and mathematicians showed the key was to spin faster, not to jump higher.

Then there is probability and statistics. We can apply 'pure reasoning' of probabilities to games of chance, but what about real life? Maths provides the foundation for clinical trials of new medical treatments, random sampling for opinion polls, and the actuarial basis of insurance.

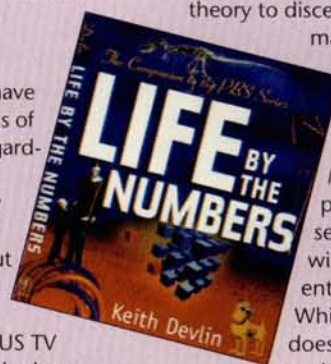
And there's the maths behind the Information Age. Our CPUs are based on Boolean algebra; messages must be routed efficiently through data and voice networks; and researchers are using graph theory to discern relationships within masses of data.

Despite its relatively small format, this is really a coffee table book. *Life by the Numbers* takes a complex subject and presents the casual reader with a colourful and entertaining glimpse. While *Life by the Numbers* doesn't attempt to teach maths, it does help readers

understand that maths is a reflection of everyday life.

Stephen Withers

■ Author	Keith Devlin
■ Publisher	John Wiley & Sons
■ Distributor	Jacaranda Wiley
■ Phone	(02) 9805 1100
■ Price	\$49.95
■ ISBN	0-471-24044-3
■ Rating	★★★





*After you've helped clean up Australia and dealt with your tax, reward yourself with a trip overseas for some international tastings.*

# All in good taste

## The Tastes of Italy, A Taste of Japan, Vegetarian Delights

For confirmed devotees of Italian food and countryside, this double-CD offering from Europress lives up to its promise of taste and delight. A Taste of Japan is somewhat limited, confining itself to the joys of sushi. Vegetarian Delights, on the other hand, takes the meatless eater through a splendid range of dietary requirements and courses from asparagus quiche to apricot upside-down pudding.

By far the most comprehensive and engaging is the Italian title. It offers a vast array of recipes, from basic pasta making through to a plethora of sauces to accompany different kinds of pasta, meat dishes and regional and seasonal specialties. It also offers photo album-style snapshots depicting picturesque views of various regions, slide show tours, and sound bites of basic vocabulary.

Ingredient lists are available in English or American terminology — grams or ounces — and each recipe is peppered with highlighted words, behind which lie short, succinct video demonstrations of basic preparation skills.



The videos and illustrations, particularly those involving steaming forksful of pasta and bubbling pots of clamshells, are enough to make you wish that smell-o-vision had been soldered onto the motherboard.

The instructions provided in the recipe sections are basic but easy to follow. The video clips, which are drawn from a standard file rather than being recipe-specific, are plentiful in some cases, and rather light in others in the Italian and Vegetar-

ian titles, and don't appear at all in Taste of Japan.

Stepping outside the kitchen, there's the opportunity to explore Italy's various regions. A map of the country proves to be mouse sensitive, and the name of each region appears as the mouse travels over the map; but a click of the button doesn't take you there, which would have seemed a natural progression. In A Taste of Japan, there's a words-only section detailing flower arranging and the tea ceremony, and better illustrated sections on the art of origami (paper folding) and sushi arranging.

Minor quibbles include the confusing instructions — all undoubtedly just teething troubles. In The Tastes of Italy the recipes are on one disc, and the tours and cultural information are on the other. But when the computer asked me for Disc One, it really wanted Disc Two, and vice versa. Once the software is properly installed, it will retrieve recipes even if you're in 'regions' or 'festivals' mode. It doesn't pay to be too quick in responding to the demand to change discs, because you generally don't need to.

Compared to early forays into food on CD, which were stilted, boring and oblivious to the full benefits of the medium, this series is a well-rounded and carefully implemented exercise. It is a conservative but considered use of the medium, and a handy addition to any foodie's bookshelf.

**Helen Dancer**

- **Publisher** Europress
- **Distributor** Europress Australia
- **Phone** (02) 9748 2555
- **Price** \$49.95
- **Requires** 486, Windows 3.1 or 95, 4M RAM, CD-ROM drive, Sound Blaster compatible soundcard
- **Rating**
  - Italy ★★★
  - Japan ★★☆
  - Vegetarian ★★★

## The Tax Files

How the hell do you make tax interesting? Virtually everybody sees tax as an infringement of their right to privacy, miserly behaviour, and generally conning the system. So an interactive CD cunningly titled The Tax Files (with the emphasis on 'X', shadowy figures in trilbies and a misty



green background) would seem to be just a bit too tongue in cheek for most of us.

However, author ASP has picked up the tax ball and not just run with it, but done a bit of bouncing, dribbling, juggling and marking on the way. The CD it has come up with is certainly as interesting as is humanly possible, given the subject.

The aim is to educate students and those not yet paying tax about the wonders of the ATO. The action opens with a comic strip scenario that tells us it's a dirty world out there . . . and a taxable one. The central narrator/hero is called Scottie Cypher. He works in a disgusting office replete with half-empty Coke cans, cold chips, mouldy coffee cups and a desk so messy you could get lost in it. And of course a computer.

Once you have read about the Tax File Number and its place in the Grand Scheme Of Things, you can dig deeper into the computer files and investigate HECS, Provisional Tax, Fringe Benefits and more. After you have familiarised yourself with the basic concepts, you can investigate Greasy Joe's fish and chip shop, which looks like it has been pulling a few fast ones in terms of financial reporting accuracy.

Resources at your disposal are the computer Tax Files, the ATO Handbook and a Filing Cabinet. Although not really a game, the program is presented as such and by the time most users have discovered there is no directed goal, they will probably have learned a lot.

One glaring omission is the ability to print out documents and guides — but this is probably because the ATO pointy heads can't predict what the next tax laws will be, rather than a wish to keep students from compiling their own underground tax guide.



## Interactive News

● The National Film and Sound Archive has begun collecting games and multimedia CD-ROMs in recognition of their social and cultural significance. The emphasis will be on archiving Australian multimedia, rather than overseas productions, and reflects the impact new technologies are having on Australian lifestyles.

● DVD's future looks rosy, following the announcement that Time Warner's home video division generated more than \$US110 million in revenue from DVD title sales in its first year. This was considered a particularly good result in light of the competition from Divx — basically simplified DVDs which are restricted to being played within 48 hours. They are priced at less than \$US5 each, compared to about \$US20 for a DVD movie. It will probably be another six months before Divx comes to Australia, so if you're desperate for digital movies DVD titles are the only option right now.

● Compaq began shipping its new fingerprint recognition systems in August. Priced at \$US99, the units allow workers to log into the network with the touch of a finger. Several companies have released fingerprint ID systems, but Compaq's is the first at an affordable price.

● Australian rock group Cold Chisel has turned to Internet technology to promote its first new recordings for 15 years. The band released a new track via its Web site, <http://www.coldchisel.com.au/>. The song, 'Yakuza Girls', is available in both RealAudio and Liquid Audio formats, and there are no plans to release the single as a conventional CD release. The band joins an increasing number of artists, including Tori Amos, David Bowie, Duran Duran and the artist formerly known as Prince, who have used the Web to release material that is unavailable elsewhere.

● Education is taking to the Net, its

interactive nature being well suited to encouraging learning. Royal Melbourne Institute of Technology already offers two of its business courses entirely online and now TAFE's graphic arts education is set to be exported worldwide. Known as OnFX, the courses are being run by a consortium of technology companies and educational institutions. The courses include basic computer skills, Macromedia FreeHand and QuarkXPress. A full graphic arts diploma will eventually be offered. A CD-ROM provides the Web browser interface and multimedia content, while the bulk of course material is accessed over the Net. Each course costs between \$150 and \$280 for three months' access. Once online and logged in, students can correspond with tutors or other students via a Web-based messaging system and complete assessments online. For more information see <http://onfx.techworks.com.au>.

Overall, a useful disc, and, best of all, it's free. Simply ring your local ATO office and ask for the Student Education Unit.

**Jeremy Torr**

■ Publisher	Australian Tax Office
■ Distributor	ATO
■ Phone	132 869
■ Price	Free
■ Requires	486/66, Windows, 8M to 16M RAM, 10M hard drive space, 2x CD-ROM drive, SVGA
■ Rating	★★★

## Ingenious

Ingenious has everything a good interactive CD-ROM needs: great graphics, an original soundtrack and an interesting plot. Decision-making is left up to the player and it's definitely a learning experience (aimed at eight to 14-year-olds). The graphics are predominately vibrant cartoons, although there are also photographs, simulations of live ABC news broadcasts, and 'Quantum' video clips.

Ingenious is a fictional international organisation that tackles environmental and scientific problems. You become a volunteer special agent and help solve the problems encountered in five interactive adventures, assisted by expert agents Red and Taurus.

Something Fishy requires you to solve



the mystery surrounding the death of millions of pilchards that have washed up on the Australian coast. Navigational skills are put to the test as you chart your way in the SS Ingenious to the dead pilchards before they sink. Water and fish samples need to be collected and then analysed in the onboard laboratory. The player has to dissect the fish and take slides to be examined under a microscope. By the time the mission is completed you will have learned all about electron microscopes and fish anatomy, as well as the dangers of pollution and viruses.

In Are we Alone? the I team is sent to the Australian National Telescope Facility at Parkes, NSW, to investigate strange signals from space. If you're lucky you'll tap into a signal that is actually a broadcast of Roy and HG talking about how they think children should only eat fruit. In Fire Fighter! you lead

a fire-fighting team during the peak Western Australia bushfire season, while Racing on the Sun requires you to design a solar car to race from Darwin to Adelaide. In The Last Tribe you help establish a breeding program to help protect the endangered Malas (rabbit-sized wallabies) found only in the Tanami Desert in the Northern Territory.

The missions are placed all around Australia, and visiting the different places is a geography lesson in itself. The issues are all described in simple and fun terms. Words that require further explanation are hyperlinked to definitions.

The CD-ROM was created jointly by the Australian Broadcasting Corporation, Quesataon (The National Science and Technology Centre) and Radiant Productions. It was funded by The Department of Communication and the Arts' CD Multimedia incentive program, and has been distributed to all Australian schools and public libraries.

**Claire Waddell**

■ Publisher	Dataworks
■ Distributor	Dataworks
■ Phone	(03) 9764 8344
■ Price	\$49.95
■ Requires	486 DX 100, Windows 3.1 or Windows 95, 16M RAM 4x CD-ROM drive, Sound Blaster 16 card or compatible; 68040, System 7.1, 16M RAM, 4x CD-ROM drive
■ Rating	★★★★☆



*Shoot 'em up, shoot 'em down,  
blow 'em up, or strike from the baseline.*

# Players with a mission

## Forsaken

It's been a while since a good Descent clone hit the shelves, but Forsaken builds upon everything that made Descent successful.

First and foremost this is a 3Dfx game. Whereas the classic Descent had only software rendering to harness, Forsaken makes full use of 3D technology — so well that it's literally astounding to watch. The brilliant use of coloured lighting, visual effects and high frame rate create an immensely absorbing atmosphere.

As you'd expect, there's a vaguely plausible storyline behind your reason for flying around deserted tunnels blowing up everything in sight. It runs something like this: scientists, in their never-ending quest for historical notoriety and the pursuit for the most pretty explosion of all time, accidentally nuked the Earth. Centuries later, bounty hunters have returned to the forsaken Earth to recover what valuable materials they can from the remnants of society. Jostling for ownership rights with myriad other bounty hunters while flying zero-grav bikes is what the game is all about.

And there are some very interesting characters from which to choose: aliens, androids and a variety of humans, from a scantily clad vixen to a large, bearded biker. Each has different personality traits and a bike to match. Choose a fast bike if you're a speed freak, or a slow heavily laden bike if you prefer to blast instead of run. Choose the character that best matches your own personality (if you dare) and enter into the tunnels in search of gold.

No 3D fight sim shoot-'em-up would be

complete without a variety of large and very noisy weapons. Forsaken comes with 15 varieties of gun, missile and mine with which to play, any of which does a good job of rending enemies apart. And who better to rend apart than your best pals? Forsaken handles up to 16 players, which, with the right level design, could lead to some very fun games.

If you've been hungering for an advanced, visually impressive, Descent-genre game with vast, complex levels, then Forsaken is for you.

### Ashton Mills

■ <b>Distributor</b>	Roadshow Entertainment
■ <b>Phone</b>	(02) 9552 8700
■ <b>Online</b>	<a href="http://www.forsaken.com/">http://www.forsaken.com/</a>
■ <b>Price</b>	\$89.95
■ <b>Requires</b>	Pentium 133, Windows 95, 16M RAM, 4x CD-ROM drive; 3D card not required, but the game can't be fully appreciated without one.
■ <b>Classification</b>	MA 15+
■ <b>Rating</b>	★★★★



layout of each mission is superb, with extraordinary attention to detail. To succeed, you need to account for such things as the precise route and timing of enemy foot patrols, or the amount of cover offered by a particular rocky outcrop. The missions are long and ingeniously designed, and the difficulty level is well balanced — hard enough to be rewarding, but not so hard (or tedious) as to be off-putting.

The game is played in real time, in the sense that guards are continuously on patrol; however, if your team can find cover, then you can plan your moves without rushing into anything stupid. Forethought, stealth and careful use of each commando's skills is the key to this game, not firepower.

The enemy in Commandos is clever — and deadly accurate with a rifle. The instant one of your men falls within the enemy's line of sight, you're done for. And if your footprints are spotted in the snow they will be investigated.

An excellent interface, clever AI and brilliant mission design make Commandos an absolute winner.

**Jon Gill**

■ <b>Distributor</b>	Ozisoft
■ <b>Phone</b>	(02) 9317 0000
■ <b>Online</b>	<a href="http://www.eidosinteractive.com/">http://www.eidosinteractive.com/</a>
■ <b>Price</b>	\$89.95
■ <b>Requires</b>	Pentium 120, Windows 95, 16M RAM, 4x CD-ROM drive, 1M SVGA card, 16-bit soundcard
■ <b>Classification</b>	M 15+
■ <b>Rating</b>	★★★★☆

## Commandos: Behind Enemy Lines

The setting is World War II and your task is to lead a small team of elite commandos through a series of dangerous missions behind enemy lines. Pre-mission briefings set the historical context and provide an overview of the task at hand, be it the destruction of a U-boat harbour in Norway, or the demolition of a fuel supply depot in North Africa.

Your team comprises six commandos, each with particular skills. The sapper is expert at laying demolition charges. The spy, having stolen a German uniform, can infiltrate an encampment in broad daylight and wreak havoc from within. Each has a distinctive personality — the Green Beret is a monosyllabic killer, the sniper a refined English gent, and the marine an insolent Australian from Melbourne.

Several factors make this game compelling. The presentation and





## Cyberstorm 2: Corporate Wars

Cyberstorm 2 is a strategic warfare game that can be played in either real-time or turn-based modes. The story behind Cyberstorm 2 involves eight corporations from the Typhoeus system battling against one another in order to gain control of a precious jump-gate. This jump-gate will bring massive expansion opportunities to the victorious corporation.

There are three playing modes from which to choose: Quickstart, Career and Multiplayer. The Quickstart mode has a couple of training missions to get you started and there are other missions that are great for gaining the experience required to complete the harder career missions.

Multiplayer games can be played by up to eight people through an IPX network or the free Internet-based World Opponent Network. Serial connection and modem play is also available for two players.

At the beginning of a Career game you must decide which corporation you wish to affiliate yourself with. Each corporation has strategic advantages and disadvantages. It is then your job to set up a base on an appropriate planet in the star system. From this base you will conduct all your missions as well as manage your resources.

The resource management is an element that may take a while to master. Vehicles must be manufactured and maintained, while the pilots of the vehicles, called Bioderms, also need to be created and kept healthy between missions. On

and are removed after successful completion.

The terrain varies for different missions and this must be taken into account when deciding which vehicles will be launched. Speaking of the terrain, the graphics of Cyberstorm 2 are good but not breathtaking. The background music, along with the sound effects and voice-overs, add to the playing experience, but if they become annoying you can easily reduce the volume as well as the quantity of sounds heard.

**Kieran McNamee**

■ Distributor	Dataflow
■ Phone	(02) 9417 9700
■ Online	<a href="http://www.sierra.com/titles/cstorm2">http://www.sierra.com/titles/cstorm2</a>
■ Price	\$69.95
■ Requires	Pentium 200, 32M RAM, 6x CD-ROM drive, 50M hard disk space
■ Classification	G 8+
■ Rating	★★★☆☆

## Anastasia: Adventures with Pooka and Bartok

The children's movie for the 1998 mid-year break was 'Anastasia', and Anastasia: Adventures with Pooka and Bartok (AAPB) hit the shops in time for the holidays.

AAPB is a simple — as in 'not complex' rather than 'easy' — adventure game. Controlling the movements of Pooka (Anastasia's dog), you must find certain objects and locations to complete a series of tasks.

Your choice of movement is generally very restricted. At one point in the game you may pass through any one of three doors, but they all take you to the same position, from which you may either go back the way you came, or continue forward. Visualising the layout of a building is made harder by the fact that your view of a scene is fixed, regardless of whether you entered it from the left or right.

So where does Bartok the bat come in? His sole purpose seems to be to pop up at all-too-frequent intervals and mouth generally unhelpful comments with mind-numbing repetition.

Click on certain objects and you're spirited away to Hades, where you must complete any one of four games to escape. Three involve strategy, the other is a simple shoot-'em-up. They are tedious if you can do them and frustrating if you can't.



Make sure your kids know how to save the game each time they complete a chapter so they have the option of avoiding these games.

The bottom line is that lush graphics and smooth animation are no substitute for playability. Anastasia is presumably aimed at the under 10s, and I doubt many kids of that age would be able to complete every stage without resorting to the hints, as some tasks have no logical basis. But with the hints, the game becomes a sterile hunt for the right locations and objects, and I saw no sign of the "new surprises and interactions" or "excellent replayability" promised on the box.

**Stephen Withers**

■ Distributor	Electronic Arts
■ Phone	(02) 9955 7744
■ Online	<a href="http://www.foxinteractive.com">http://www.foxinteractive.com</a>
■ Price	\$49.95
■ Requires	486/66, Windows 3.1 or later, 8M RAM, 2x CD-ROM drive, soundcard, SVGA; also Mac compatible
■ Classification	G
■ Rating	★★

## Triple Play 99

EA Sport's Triple Play 99 captures the essence of baseball and puts you on top of the pitcher's mound. It also has you batting at the plate and taking miraculous catches in the outfield.

Each Major League Baseball team is represented, including the two expansion teams from Arizona and Tampa Bay. All players from the 1998 team rosters are included, and there are reams of statistics for each.

There are six game modes to choose from. A full season can consist of 15, 30, 60, or 162 games, but if you want a shorter challenge then there are exhibition, all-star, tournament and play-off games. Home Run Derby is the sixth mode and it



top of this there are income and technological restrictions with which to contend.

Missions are categorised under four headings: Mining, Exploration, Patrol and Special. The Special missions usually require combat with the enemy and can be assigned when you least expect it. Other missions can be selected from a list



**Don't nibble at  
the net...**

**take a  
bigger  
byte!**

**Dynalink  
MODEMS**

**Get high speed Internet  
downloads with a  
Dynalink PRO 56 modem!**

All Dynalink modems include a great  
with free offers from:

**OZEMAIL**

**COMPUSERVE**

**MULTIPLAY**

**QUAKE**



GT ROADSHOW INTERACTIVE id

QUAKE™ ©1996 ID Software Inc. All rights reserved. id™ and the id logo™ are trademarks of ID Software Inc. GT™ and the GT logo™ are trademarks of GT Interactive Software Corp.  
PARENTAL WARNING: MA-15+. High level of animated violence.

**Internet  
PHONE**

Use your modem and computer with soundcard to talk with friends all over the world without incurring international toll charges.

FROM VOCALTEC

**VOICEGUIDE**

**Unleash the full telephony power  
of your Dynalink Voice Modem**

Automate your home or office telephone and fax requirements to your own custom design using this powerful tool.

**From all good computer stores  
or call Askey Australia 1800 357 253**



is a great way to finetune your swing.

Controlling your players is fairly straightforward. The secret behind batting is in the timing of your swing as well as having the courage to let outside balls pass. When fielding you can select what kind of pitch to throw and use the arrow keys to direct it. Basemen and outfielders are easily controlled and the location of fly-balls can be determined by a black dot on the field that gets smaller as it gets closer to the ground.

The multiple camera angles allow you to decide how you want to see the pitch. The batter's point of view is a new angle.

As well as play-by-play commentary from two TV game announcers, there is also an array of background sounds that give you the feel of being at the game.

The multiplayer element is particularly impressive for a sports title. You can play via network modem and with up to 30 players in Internet season play.

**Kieran McNamee**

■ Distributor	EA Sports
■ Phone	(02) 9955 7744
■ Online	<a href="http://www.easports.com">http://www.easports.com</a>
■ Price	\$29.95
■ Requires	Pentium 166, 32M RAM, 8x CD-ROM drive, 100M hard disk space
■ Classification	G
■ Rating	★★★★



## Monster Truck Madness 2

Anyone who's played the original Monster Truck Madness (MTM), which put you behind the wheel of a monster truck and sent you out to race other would-be red-necks, will feel right at home with MTM2.

The main additions to the new version are a selection of 11 new tracks, ranging from conventional (Farm Road 29) to downright bizarre (The Graveyard). You can also race on standard and custom tracks from the original version of the game. Trucks (including the 11 originals from MTM1 and nine new models) now

show damage as they're careening around in a dangerous fashion. The 3D graphics are a little smoother, and the music a little more varied. Weather conditions can also be set for each track, ranging from clear to snowy.

MTM2 supports networked and Internet play, with up to eight players able to compete via Microsoft's Internet Gaming Zone site. A new game type, the Summit Rumble, has been included for online users.

Like the original, Monster Truck Madness 2 is highly addictive, and the down-home Southern commentary from monster truck 'identity' Army Armstrong adds to the atmosphere. The new weather conditions allow you to get more varied play from your favourite tracks, and you can also customise your truck as your skill level progresses. Truck handling, even playing as a rookie with automatic transmission, can be tricky. The professional and manual options definitely require practice, but your patience will be rewarded. If the thought of trashing a large truck in multiple locations while destroying numer-



ous other monster vehicles appeals, then MTM2 delivers.

**Angus Kidman**

■ Distributor	Microsoft
■ Phone	132 058
■ Online	<a href="http://www.microsoft.com/games/monster/">http://www.microsoft.com/games/monster/</a>
■ Price	\$79
■ Requires	Pentium 133, Windows 95/NT 4.0, 16M RAM, 4x CD-ROM drive, soundcard
■ Classification	Not available
■ Rating	★★★

## Games News

- Every marketing and PR division in the games industry wants a good review and score for their company's games, but Sierra may have just gone a little too far with its latest stunt. You would be excused for thinking that Sierra's *Cyberstorm 2* is a great game — especially as *Interaction* magazine's rating of 4.5 stars is prominently placed on a sticker on the box cover. However, what you might not know is that *Interaction* is an in-house Sierra production that only reviews Sierra products. Now, it's not the actual magazine that GameSpy has a problem with (Sierra's interests are clearly labelled in the mag). But on the *Cyberstorm 2* box there is no mention whatsoever of the *Interaction*/Sierra link. Creative marketing, or a complete lack of integrity? GameSpy will let you decide.
- Duke Nukem Forever (DNF) was being developed (by 3D Realms) using the Quake 2 engine, which had been licensed from id Software. Not any more. Soon after the release of Unreal, the development team for DNF took one look and decided that the Unreal game engine was much better. So it dumped the Quake 2 engine, and licensed out the Unreal

engine instead. Epic Megagames (developer of Unreal) was left feeling very pleased with itself, and rightly so, but the people from id Software didn't have much to say about the situation, funnily enough. In fairness, they were in the middle of some substantial changes to their plans at the time...

● John Carmack, CEO and co-founder of legendary id Software, recently dropped a bombshell on the gaming community when he announced that id had decided to can development of Quake 3 in favour of a new direction. It is still making a Quake-related game, dubbed Quake Arena, but it will be a multiplayer game only. Perhaps it was sick of the criticism levelled at the single-player aspects of Quake and Quake 2, but whatever the reason, the next Quake game will be deathmatch only. There will be a single-player mode, but this will only be in the form of deathmatch practices against bots (computer-controlled players). Innovative new direction for computer games, or a short-sighted solution to the criticism? GameSpy knows which one it thinks is appropriate...

**GameSpy**



*Food is more than just sustenance — it's a ritual, as well as a way of life. This month's sites will get the kitchen going, while Surfbaud gets the brain moving.*

# Food for thought

## The Australian Meat & Livestock Corporation

This site is a meat lover's dream. All the recipes contain either beef or lamb, as it is produced by the Australian Meat & Livestock Corporation (AMLC). Despite this limitation it is an excellent site, which combines nutritional advice with recipes that take advantage of the great range of fresh produce available in Australia.

All the recipes have clear instructions and those we tried were successful, especially the red curry beef and curried lamb kebabs. The recipes are the same as those that appear on the AMLC's printed handouts available from butcher shops and in supermarket meat departments. All the ingredients are readily available, and most include fresh vegetables and herbs. Recipes range from lamb souvlaki to lemon peppered kettle roasted beef, and are separated by cuisine, including Italian, Mediterranean, Indian and Mexican. All the recipes serve four, and although they don't include estimated cooking times, most are not labour-intensive.

Good tips on meat cooking abound. For tender stir-fry strips the AMLC recommends placing the cut in the freezer until firm and then slicing across the grain. There is a whole section devoted to Cooking Advice. All the different methods of cooking,

FAQs on freezing, refrigerating, preparing and cooking red meat. All the Food Safety brochures can be ordered online.

The Nutrition Update pages provide information on iron deficiencies and low-fat eating, and include a five-day menu plan for a high-iron, low-fat diet. Most recipes include a table of the nutritional value of each serve, including calories, protein, fat, iron and zinc content. The key nutrients of every beef and lamb cut are also provided.

There's also a comprehensive section on issues concerning the meat and livestock industry itself, including the AMLC's quarterly newsletter, *Vital*.

This is an attractively designed site which is easy to navigate. There isn't a search tool for the whole site, but the drop-down menus make it easy to find a recipe. Photographs of all the finished results are attractive, but on a slow Internet connection the time it takes for pages to load can be frustrating.

**Claire Waddell**

■Online <http://www.amlc.com.au>

■Rating ★★★★★

## Epicurious

A magazine once put famous chefs to the test by asking them to prepare a meal in a reader's kitchen with its usual supply of food — a challenge most of us face every day. To my mind the winner was the chef in the barest kitchen who made a wonderful dish from dried mushrooms, lentils and a few odds and ends.

I went to Epicurious, a food and drink site from Condé Nast, looking for a guide to help me overcome such cooking dilemmas. I wasn't disappointed. The site's best feature is its recipe database with over 7,600 recipes from *Bon Appétit* and *Gourmet* magazines, books, and classic *House & Garden* recipes dating from the '50s. Epicurious's search engine lets you search on any combination of ingredients, courses, preparation methods and cuisine. IE4 users can even download this great resource and search it offline.

As its name suggests, Epicurious is aimed at people who are interested in the creation and consumption of food and drink. It offers all kinds of useful information, some of

which is hard to find, as there is no index or site map. It is broken down into Eating, Drinking and Playing with your Food, a section comprised of "musings on everything from junk food to table manners".

I found Drinking to be the most useful, with an extensive range of quizzes and



tutorials including a wine knowledge test (I failed miserably), a lesson on champagne, and tips for using the right glasses for the right drinks, as well over 450 cocktail recipes including my favourite, Bellinis.

Throughout there is sensitive linking to relevant pages, such as maps, an online bookseller and dictionary entries. The dictionary is impressive. It contains 4,200 entries from Sharon Tyler Herbst's *The Food Lover's Companion*, and offers amazingly detailed descriptions and histories of food terms.

My main complaint was that a lot of the recipes didn't appeal, probably because I am not the target audience. It's American food aimed at Americans. Many food features were also tailored to northern hemisphere seasons and included ingredients that aren't available here, such as half-and-half. To be fair, comparable Australian sites are not as extensive as Epicurious.

Many of the recipes are oriented towards homemaking baby boomers who have dinner parties, rather than easy, basic food you can prepare for 10 people in 10 minutes. But there is a vast range of recipes, and there are cooking lessons, with tips and shopping lists. I tried the low-fat banana bread recipe, never having made this before, and it was easy and delicious.

Saving the best till last, hidden deep in Epicurious, I found a gem of a column: 'Wish You Were Here: Postcards from the



including stir-frying, microwaving and kettle roasting, are explained, and suggestions are given for suitable meat cuts.

If you've ever worried about mishandling food or causing food poisoning, the Food Safety pages cover everything from preparing food in the home, to eating out in restaurants. There are also specific



edge of culinary respectability' is a homage to diner cuisine written by 'road-food scholars' Jane and Michael Stern, with reports on sloppy joes in Tucson, Arizona, whoopie pies in Freeport, Maine and caramel rolls in Sheridan, Wyoming. A must-read.  
**Dominique Jackson**

■ Online <http://www.epicurious.com>  
■ Rating ★★★★★

## Ketchum Kitchen

If you dream of whipping up a batch of peanut butter icing for your next cake, then Ketchum Kitchen is for you.

Ketchum Kitchen is run by public relations firm Ketchum Public Relations Worldwide from San Francisco, which nominates food and nutrition as one of its specialties. A quick visit to its Web site tells you Ketchum Kitchen's reason for being: creating recipes to whet the appetites of consumers for its clients' products. To this effect, Ketchum claims a hand in popularising the kiwifruit in the US.

This in itself didn't worry me as much as some of the recipes (namely the aforementioned peanut butter icing suggested for chocolate cake). The recipes just don't sound all that appealing.

Take for instance Layered Tuna Bowl, which directs you to "layer in a glass bowl, shredded iceberg lettuce; halved cherry tomatoes; chopped red onion; flaked, drained canned tuna; and drained, canned sliced ripe olives. Season with salt and pepper. Cover with a layer



of mayonnaise, and sprinkle with minced parsley". Iceberg lettuce? Layer of mayonnaise?

Or, another example, Potatoes Heaven and Earth, which combines potatoes, apples and poppy seeds, with the final instruction to serve hot with a dusting of cinnamon and parsley.

Maybe the problem is that a diet of coffee table cookbooks has weaned us off

## Surfbaud: Bread alone?

If we were machines, keeping ourselves fuelled would simply be a matter of putting together some essential minerals into a powder and adding water. Quite a bit like dog food or bird seed, in fact.

Our sentence is what makes the idea of a powdered nutrient formula a horrendously boring idea — after all, eating isn't just keeping the machine fuelled, it's also about culture, ritual and human bonding. Food, for a variety of reasons, can also be as powerful an addiction for some people as narcotics or alcohol. Intentional lack of food, whether characterised by diseases like anorexia and bulimia, or by ritual fasting, can be an equally powerful addiction.

Examining cultural attitudes to food, and the assumptions made about the food consumed by certain cultural or racial groups, can be an enlightening experience. One of the best examinations of this appears in the online publication *Yolk* magazine, a title aimed at a young, urban Asian-American audience. *Yolk* looks at the cultural conditioning associated with the practice of dog eating, the stereotypes imposed on members of those cultures that do (or did), and the way that social conditioning changes the manner in which we perceive different food types.

"If you conditioned me so that I thought it was socially acceptable to eat dog — like if they advertised 'Kentucky Fried Dog' on TV — maybe then I would eat dog", the magazine said.

There is such a stigma attached to eating any type of domesticated animal in the US that even recent Asian immigrants

think that what their ancestors may have eaten was barbaric. And the reason for all this rustling: socialisation.

Although consumption is only part of the appeal, and indeed the ritual of eating, modern media forms, particularly TV, magazines and lately the Internet, have turned food into a fetish, something to be more admired for its aesthetics and its implied values than for its fuel value. Sites such as the ABC's *Consuming Passions*, the sites reviewed in this month's Web File and others, all exhibit this characteristic to some degree. As do magazines like *Gourmet Traveller*, *Vogue Entertaining* and *Gourmet*. Food becomes associated with a certain mode of living.

This associative role of food can also be seen in terms of history, with myriad sites online offering medieval cookbooks as part of an overall medieval lifestyle fantasy. What's a pity is that these simulations adhere to a certain notion of history, primarily Eurocentric, with little discussion of food types and histories from other parts of the globe.

The Internet is the richest lode available for information on cooking and our attitudes towards food. The links below are an interesting starting point:

**Yolk** <http://www.yolk.com/magazine/iss2/dog.html>

**Consuming Passions** <http://www.abc.net.au/passions/>

**The Olde Cookery Book** <http://www.bahnhof.se/~chimbis/tocb/foreword.htm>

**Le Poulet Gauche** <http://www.lepg.org/>  
**Josh Gliddon**

good, homestyle cooking. All those beautifully photographed creations in the glossy publications bring an element of inspiration that recipes like Summer Squash Relish from Ketchum Kitchen lack. Alternatively, it may be that, as many commentators have suggested, Australians enjoy a cosmopolitan array of creative and exciting food. Certainly the availability of fresh ingredients in this country, to my mind, is much more appealing than Ketchum's heavy use of pre-prepared, frozen or tinned food.

Although the navigation is basic and lacks sophistication, the site does have a simple, wholesome feel, and weekly updates ensure a steady flow of new material. The database of recipes is very easy to use, with options to search on sub-

ject area, like Bread, or for a particular ingredient.

Typically the recipes specify a particular brand (the PR angle) but this should not be too big an issue, as many of the products, or suitable replacements, are available locally. You'll also need a converter to guide you from imperial into metric measurements.

Despite the recipes at Ketchum Kitchen lacking a certain edge, visitors do have the assurance that they originate in a test kitchen. The combined experience of the staff is impressive, even if the recipes seem to be the kind of thing Alice would bake for the Bradys.

**Deanne McIntosh**

■ Online <http://www.recipe.com/>  
■ Rating ★★★



# Ultimate System Armor

# TOP Tech.

## (Thermal Overheat Protection Technology)

MSI's latest stunning technology, the TOP (Thermal Overheat Protection) Tech., arms your system an ultimate protection from deviated CPU temperature detection!

### • 100MHz FSB:

Support all Intel Pentium® II processor up to 450MHz

### • PC Alert:

Provide your system information on:

- Temperature (CPU, System)
- Fan (CPU, System, Power Supply)
- Memory Statistics
- Voltage (CPU, Power Supply)
- HDD Statistics
- Chassis Intrusion

### • TOP Tech.:

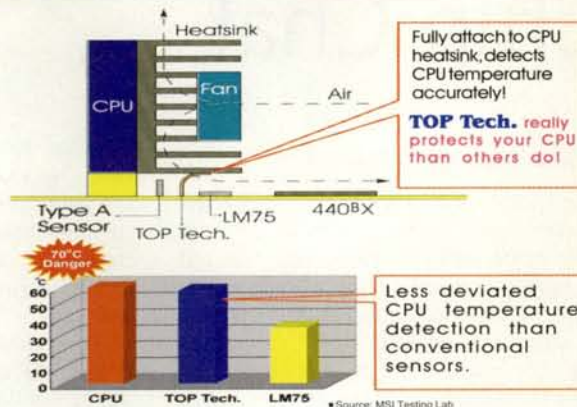
Report CPU Temperature to System Accurately, preserve system stability & life span

### • SoftCooler:

Cool down your CPU effectively without adding burden on your system performance

### • CPU Plug & Play:

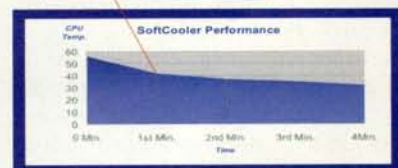
BIOS provides frequency and core/bus ratio settings for users to select from.



## Software CPU Cooling Device

- Cool down your CPU temperature effectively without adding further hardware
- System performance not affected
- Build-in in PC Alert system hardware monitor software

CPU 33% Cooler in 1st minute!



## System Hardware Monitor Software

- Detect following PC hardware status during real time operation:
  - Temperature (CPU, System)
  - Fan (CPU, System, Power Supply)
  - Memory Statistics
  - Voltage (CPU, Power Supply)
  - HDD Statistics
  - Chassis intrusion
- Automatically detects language of O.S. and install proper language accordingly
- Available in 7 languages:
  - English, Chinese (Traditional & Simplified), German, French, Russian, Japanese
- Provide error log file or trouble shooting



System Hardware Monitor Software

Intel APAC DEMO Board



## MS-6116

Intel® 440BX AGPset ATX Mainboard

- **CPU:** Intel Pentium® II processor up to 450MHz or faster
- **Memory:** 4 DIMM. Max. 512MB, or 1GB registered SDRAM (Support ECC)
- **I/O:** 2 Serial, 1 Printer, 2 USB ports, Floppy, IrDA (register)
- **BIOS:** ACPI, DMI, PnP, Green
- **Slot:** 3 ISA, 4 PCI and 1 AGP. 30cmx22.5cm, ATX

Award Winner



• Best Performer in C1 Magazine, Germany (Issue 8, 1998)

## MS-6119

Intel® 440BX AGPset ATX Mainboard

- **CPU:** Intel Pentium® II processor up to 450MHz or faster
- **Memory:** 3 DIMM. Max. 384MB, or 768MB registered SDRAM (Support ECC)
- **I/O:** 2 Serial, 1 Printer, 2 USB ports, Floppy, IrDA (register)
- **BIOS:** ACPI, DMI, PnP, Green
- **Slot:** 3 ISA, 4 PCI and 1 AGP. 30cmx18.6cm, ATX

Audio



## MS-6123

Intel® 440EX AGPset Micro ATX Mainboard

- **CPU:** Intel Pentium® II processor up to 333MHz, Celeron™ processor
- **Memory:** 2 DIMM. Max. 256MBSDRAM or EDO DRAM (Support ECC&EC)
- **Audio:** YAMAHA YM715, provide 1MIDI/ Joystick, 1 Line-out, 1Lin-In, 1Mic in connectors
- **I/O:** 2 Serial, 1 Printer, 2 USB ports, Floppy, IrDA
- **BIOS:** ACPI, DMI, PnP, Green
- **Slot:** 2 ISA, 2PCI and 1 AGP. 24.4cmx19cm, Micro ATX



MSI Headquarters  
Micro-Star International Co., Ltd.  
No. 69, Li-De Street, Jung-He City, Taipei Hsien, Taiwan  
Tel: 886-2-3234-5599 (REP)  
Fax: 886-2-3234-5488 (REP)  
<http://www.msi.com.tw>

Branch office  
MSI Computer Australia Pty. Ltd.  
Tel: (02) 9868-6962  
Fax: (02) 9868-6968  
<http://www.mystar.com.au>

• The specification is subject to change without notice.  
• MMX is a trademark of Intel Corporation.  
• Pentium is a registered trademark of Intel Corporation.  
• All brand names are registered trademarks of their respective owners.



*A tale of several cities, and mucho defective software.*

# Chip Chat

## It started with a DLL

We're going to invert normal Chip Chat practice here. Instead of telling you a series of stories and letting you work out the moral for yourself, we're going to tell you a moral and then back it up with a particularly long and painful story. So here's the moral: don't trust technology as far as you can throw it. We doubt this will be news to many of Chip Chat's readers.

It began as a perfectly normal month for Chip Chat. The examples of stupidity and sheer venality among computer users and vendors were piling up thick and fast. There was a little bit of everything: a dumb example of search engines at their worst, a stupid quote from a Microsoft representative, an even stupider quote from a bandwagon-jumping politician, and assorted other pieces of rumour, gossip and general nastiness. Chip Chat roamed around Australia and the world seeking the latest news and views on a series of tax-deductible business flights. Life was sweet. Until — the day arrived.

After a particularly long and protracted drinking session with a bunch of unidentified industry sources in a remote location, Chip Chat arose to compile the very best examples from a virtual file now bulging with material. And then it happened. For no obvious reason, Lotus Notes (our information management tool of choice) decided to crash. Nothing unusual about that. But when we rebooted and went to reload Notes, it refused to operate. A series of obscure errors messages relating to DLLs, missing library files and other technology disasters was all we could muster up. We had no access to a fresh copy of the software, or even another machine running it. With just two hours before final deadline, what were we to do?

## Heads will roll!

Like any good sleazebag reporter, Chip Chat immediately wanted to know one thing: whose fault was this? Who could be blamed for this tragic state of affairs, and could they be sued?

Our initial instinct was, of course, to blame Notes. However, to be fair, there were a range of other available culprits. At

the time the crash occurred, we were also using Netscape Navigator — not always the friendliest of co-residents with other software that uses TCP/IP. And we were running under Windows 95, itself a good choice of culprit whenever *anything* goes wrong.

Even more notably, however, at the time of the crash, the browser was pointing at the Web site of a computer magazine that was not (and we're ashamed to admit it) APC. We're still collecting the evidence, but we suspect industrial sabotage.

## And then the rains came

So much for blame. The even more burning question was, what could we do now? In sheer desperation, we considered a range of options, including:

- Printing a really, really big picture of Bill Gates being attacked with a cream pie. (Then we remembered we'd done that before.)
- Placing a short statement on the page

reading: "Chip Chat has been cancelled this month due to the Asian economic crisis." (This is used as an excuse for everybody else, so why not us?)

- Running around the room yelling 'Wibble' until the men with straitjackets came to take us away.

In the end, however, we decided that telling our cautionary tale would remind our readers that in the world of technology, nothing is certain. Take nothing for granted. Make regular backups. Carry spare installation CDs for every piece of software you might ever need to run. And always make sure you're wearing clean underwear in a crisis.

We're sure that some people would suggest that the real moral of the story is 'Don't leave everything until the last minute', but we don't care. Chip Chat will now keep all notes on a roll of high-security toilet paper, and will spurn the Pentium II in favour of a trusty manual typewriter. Well, at least until next month.■

## Contest: Technology gag of the month

In keeping with this month's 'computers are a joke' theme, we're proud to announce a new feature of Chip Chat: the Technology Gag of the Month. We're looking for technology-related jokes of all kinds, because quite frankly we could really do with a laugh. Here's our current favourite:

A man goes for a balloon ride and suddenly realises that he's lost. He brings the balloon down to just above ground level, and calls out to the woman below "Can you tell me where I am please?"

"Sure," she replies. "You're in a balloon 8m above the ground."

"Aha!" he replies. "You must work in information technology."

"Yes, I do," she replies, surprised. "How could you tell?"

"Because all the information you've given me is accurate, but you haven't given me anything to actually solve my problem."

"Ah, but you must be a manager," the woman replied.

"Yes, I am. How could you tell?"

"Because you don't know where you are, or where you're going, and you were in the same position before we met, but now it's my fault."

**OK, now it's over to you. Got a computer joke that's worth sharing? Send your suggestions — the shorter and funnier the better — to**

**chipchat@acp.com.au. If we publish your joke, you'll win a year's free subscription to APC, or one of a range of mystery prizes we haven't yet decided on.**

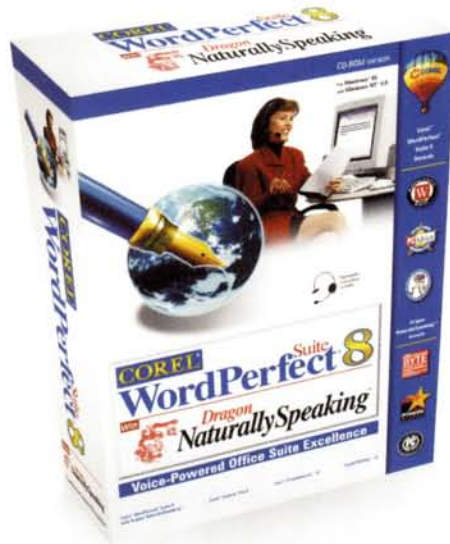




# Communicate *Naturally*



Don't let your great ideas slip away. Get them down on paper instantly just by speaking to your computer! **Corel® WordPerfect® Suite 8** with **Dragon NaturallySpeaking™** gives you a hot new speech recognition system fully integrated into a world-class word processor. It means you can talk, not type. Think out loud and get *it all* on paper. It's liberating. It's hands free. It's new technology that remembers you're human. Corel WordPerfect Suite 8 with Dragon NaturallySpeaking—communication the way nature intended.



Enjoy the **freedom.**

Word processing through the **power** of your **voice.**

This advertisement was designed and created using award-winning Corel graphics software.

www.corel.com  
Corel Customer Service Centre  
Tel: 1-800-658-850  
Fax: 02-9905-6870

**CITY  
SOFTWARE**  
Unit 3 Slough Estate, 45 Gilby Road  
P.O. Box 497, Mount Waverley, Victoria 3149  
Phone: (03) 9558 9555 Fax: (03) 9558 9900

**COMPUTER  
SUPERSTORE**  
**Harvey Norman**  
THE COMPUTER & OFFICE SPECIALISTS

**HARRIS  
TECHNOLOGY**  
Australia's Premier Computer SuperStore  
TEL: (02) 9957 1142 FAX: (02) 9957 3345  
Internet www.ht.com.au

**COREL®**  
**Go further™**

KLP-0565-UK

Copyright © 1998 Corel Corporation. All rights reserved. Corel, WordPerfect and the Go further logo are trademarks or registered trademarks of Corel Corporation or Corel Corporation Limited. Dragon NaturallySpeaking and the Dragon logo are trademarks of Dragon Systems, Inc. Windows and Windows NT are trademarks or registered trademarks of Microsoft Corporation. All other product, firm and company names and logos are trademarks or registered trademarks of their respective companies.



# complete business solutions

## tpg internet

- ▶ DIAL UP INTERNET CONNECTIONS  
\$1 OR LESS PER HOUR ANY TIME
- ▶ PERMANENT INTERNET CONNECTIONS  
FROM \$1800
- ▶ WEB SITE DESIGN & HOSTING
- ▶ INTRANETS & EXTRANETS
- ▶ VIRTUAL PRIVATE NETWORKS
- ▶ E-COMMERCE

## tpg network

- ▶ LOCAL AREA NETWORK CONNECTIONS
- ▶ WIDE AREA NETWORK CONNECTIONS
- ▶ INTEGRATED DATA, VOICE, VIDEO,  
FAX & INTERNET
- ▶ ACCESS & DATA SECURITY
- ▶ FULL CONSULTANCY SERVICE

## tpg systems

- ▶ DESKTOPS
- ▶ NOTEBOOKS
- ▶ SERVERS



65 Waterloo Road NORTH RYDE NSW 2113

Phone: 02 9850 0800 Fax: 02 9878 3877

E-mail: [promo1@tpg.com.au](mailto:promo1@tpg.com.au)

*special offer trial us today!*

# FREE 100 INTERNET HOURS\*

TO REGISTER COMPLETE THE FORM ON THE ENCLOSED APC CD OR  
VISIT [www.tpg.com.au](http://www.tpg.com.au) AND SELECT ONLINE REGISTRATION

\* A Registration Fee of \$30 is applicable; Registration without payment will not be processed; Registration Fee is non refundable; TPG Internet Access Hours are valid for the hours specified or for a period of 30 days or by 31 October 1998 whichever is reached first; hours start from the date you first logon to the Internet; Accounts will be automatically terminated after hours have been utilised. To renew your account please contact TPG Internet or your nearest reseller; New Subscribers Only; One FREE 100 Hour Package per person; Offer Ends 31 October 1998; TPG Internet Subscribers are bound by the terms and conditions found on our web site; For any technical support please contact your nearest reseller or call TPG Internet Help Desk 190 222 0305 at a rate of \$2 per minute billed directly to your Telstra telephone account

SALES ENQUIRIES PHONE:

02 9850 0800 OR VISIT [www.tpg.com.au](http://www.tpg.com.au)